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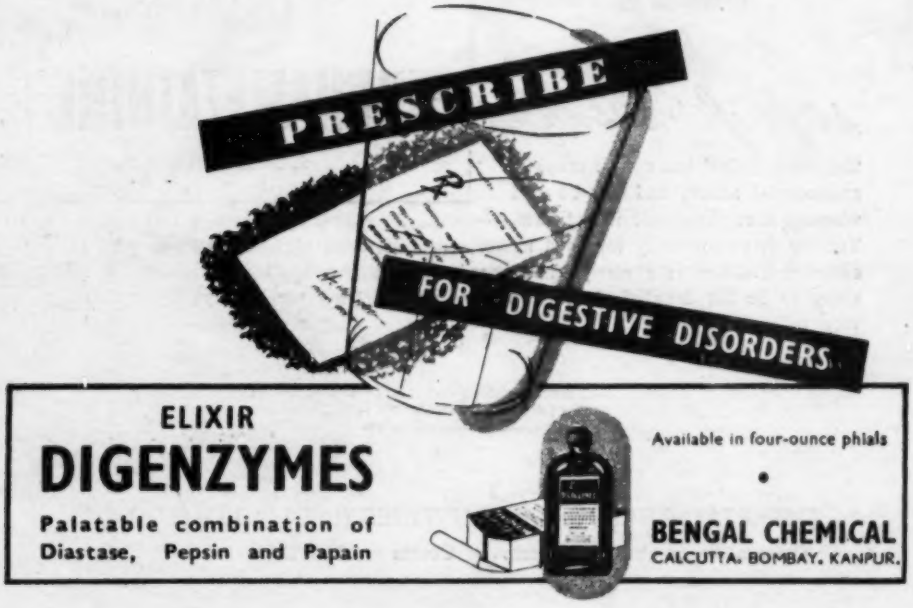

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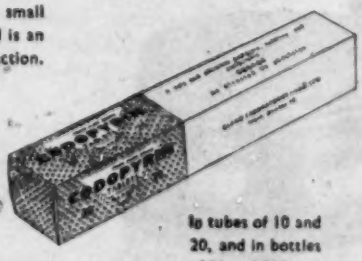

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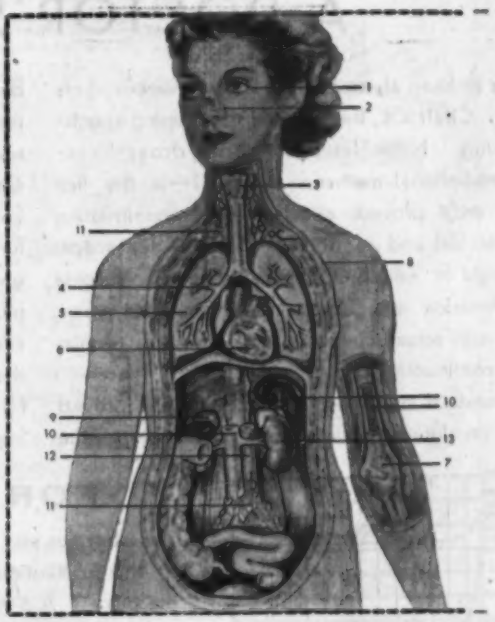

Primary site of pathology	*Indications*
1. EYE	Inflammatory eye disease
2. NOSE	Intractable hay fever
3. LARYNX	Laryngeal edema (allergic)
4. BRONCHI	Intractable bronchial asthma
5. LUNG	Sarcoidosis
6. HEART	Acute rheumatic fever with carditis
7. BONES AND JOINTS	Rheumatoid arthritis Rheumatoid spondylitis Acute gouty arthritis Still's Disease Psoriatic arthritis
8. SKIN AND CONNECTIVE TISSUE	Pemphigus Exfoliative dermatitis Atopic dermatitis Disseminated lupus erythematosus Scleroderma (early) Dermatomyositis Poison Ivy
9. ADRENAL GLAND	Congenital adrenal hyperplasia Addison's Disease Adrenalectomy for hypertension, Cushing's Syndrome, and neoplastic diseases
10. BLOOD BONE MARROW, AND SPLEEN	Allergic purpura Acute leukemia† (lymphocytic or granulocytic) Chronic lymphatic leukemia†
11. LYMPH NODES	Lymphosarcoma† Hodgkin's Disease†
12. ARTERIES AND CONNECTIVE TISSUE	Periarteritis nodosa (early)
13. KIDNEY	Nephrotic Syndrome, without uremia (to induce withdrawal diuresis)
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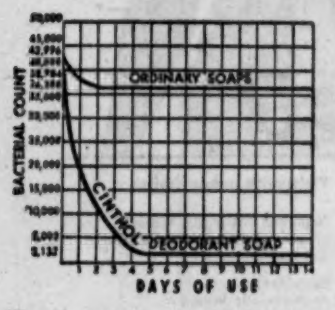

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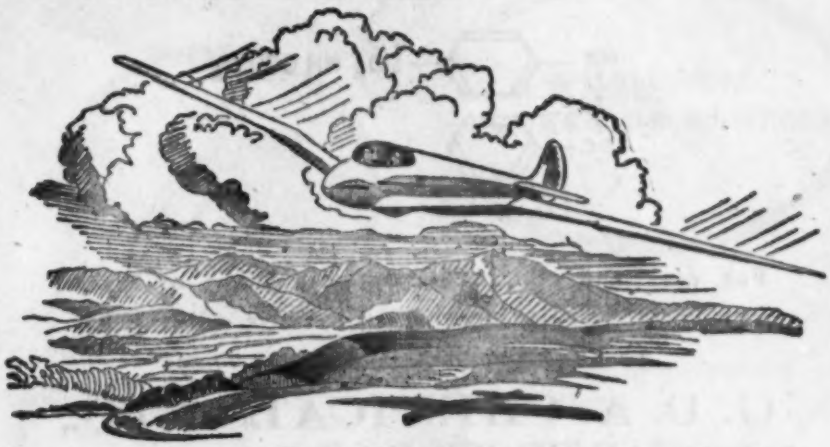

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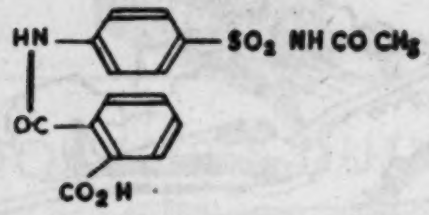

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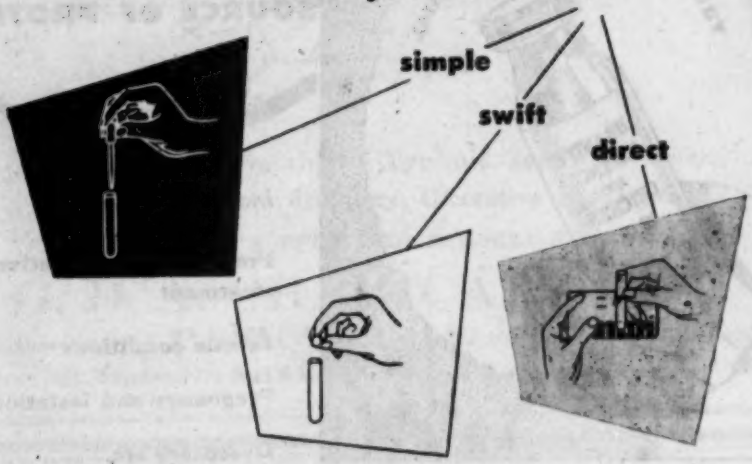

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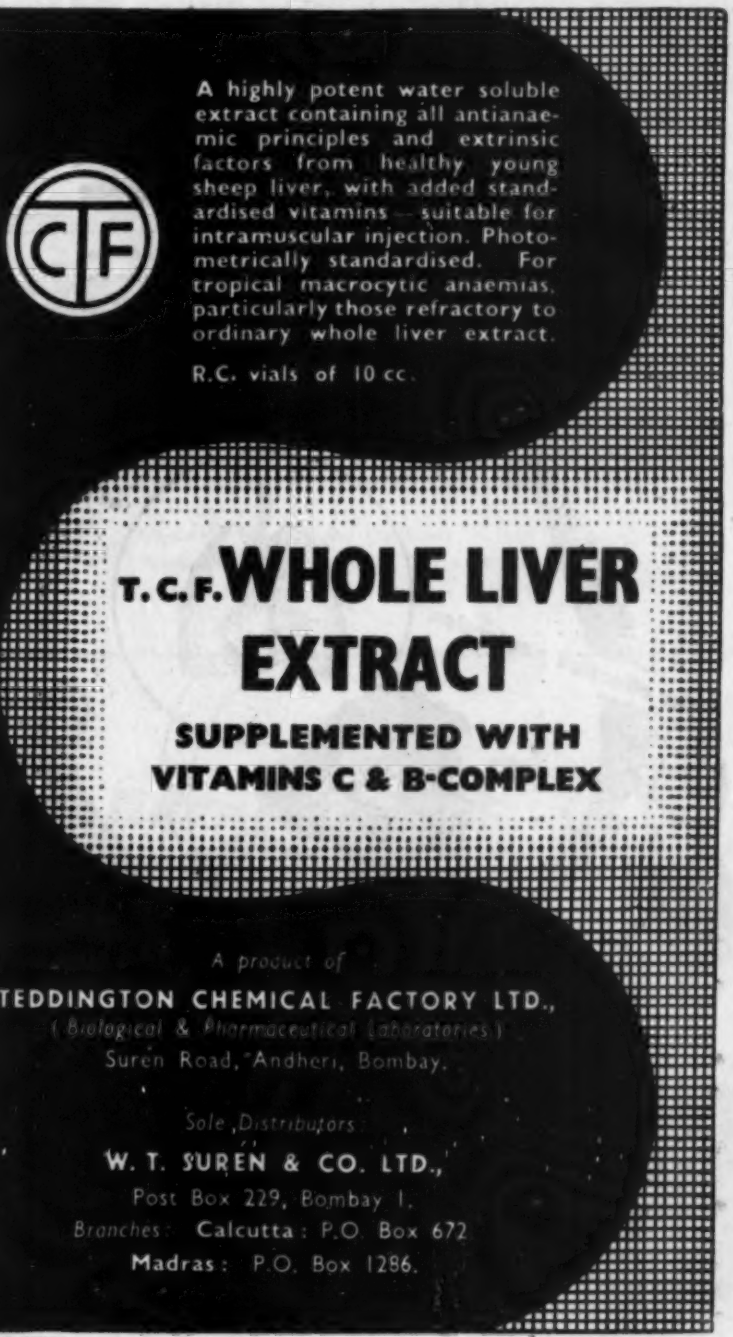
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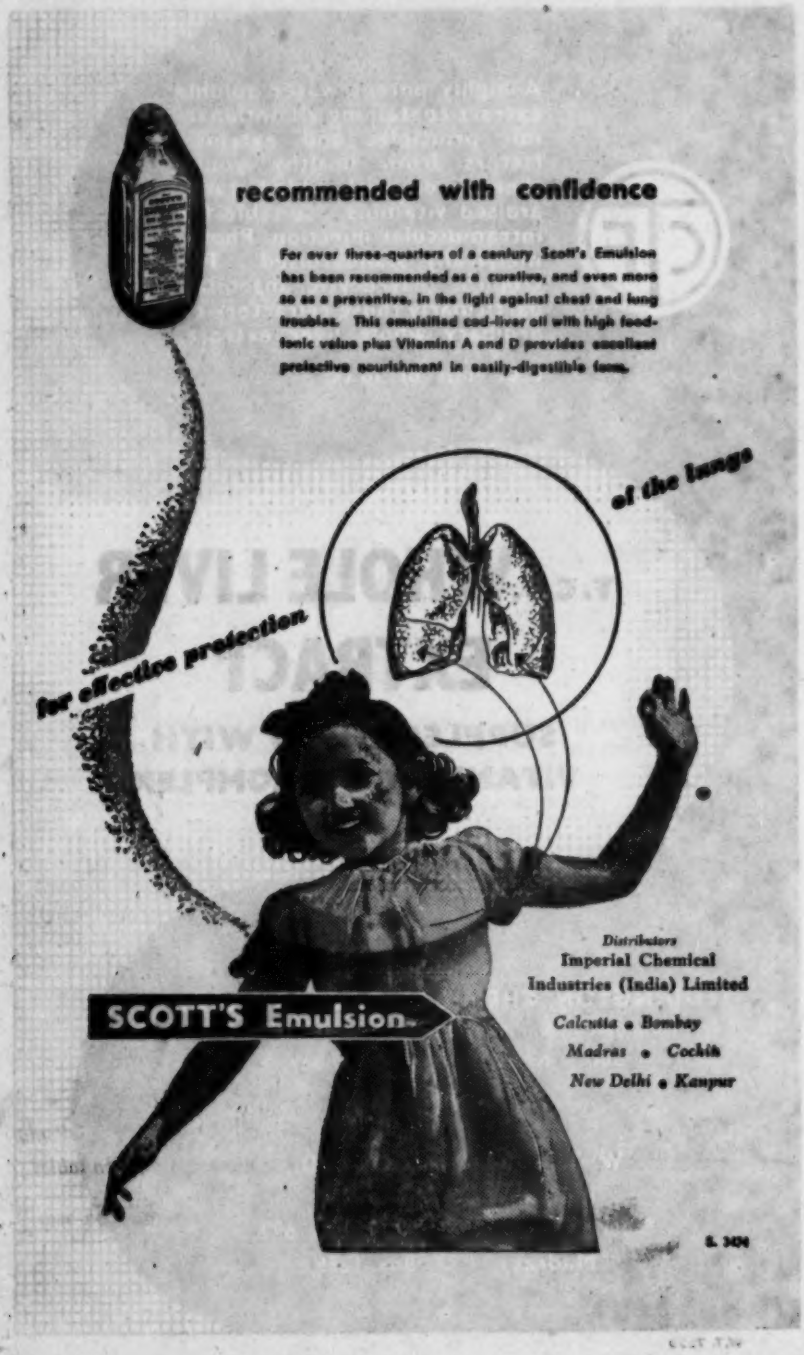
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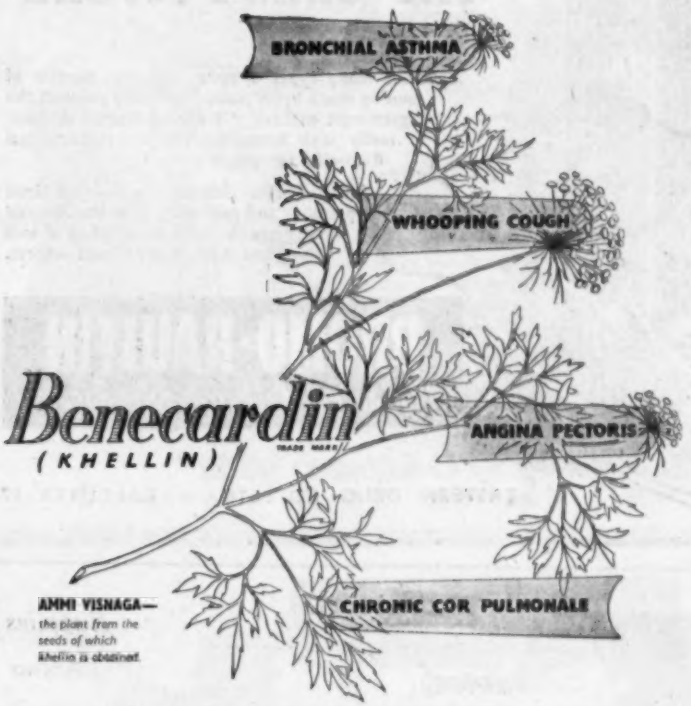

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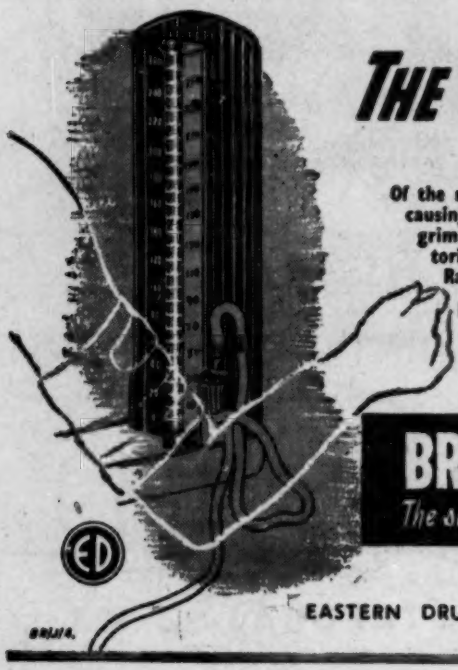

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Journal of the Indian Medical Association

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ORIGINAL ARTICLES

PATHOGENESIS AND MECHANISM OF DILATED PUPIL IN INTRACRANIAL LESIONS

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AND

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In general practice it is not uncommon to find dilated pupils and we are constantly confronted by the question of its significance in the diagnosis and prognosis of the case. It is one of the clinical findings of grave importance in all intracranial lesions. An attempt is made here to discuss the pathogenesis and mechanism of the dilated pupil in correlation to the intracranial lesions admitted in the Neurology and Neurosurgery Department of the C. M. C. Hospital, Vellore, during the year 1951-52.

During this one year, 31 cases of dilated pupils were admitted into this hospital. Some of them had fixed pupil and others showed diminished light reflexes. They were either unilateral or bilateral. In most of the cases it was not possible to ascertain the light perception due to loss of consciousness. All these cases are classified according to their ætiology as follows:—

1. Intracranial tumours—(*a*) supratentorial and (*b*) infratentorial; 2. Trauma producing intracranial lesions 3. Intracranial inflammatory lesions 4. Intracranial degenerative lesions 5. Intracranial vascular lesions 6. Congenital intracranial defects (hydrocephalus).

1. (*a*) Supratentorial tumours: Out of the 11 supratentorial tumours the dilatation of pupils was bilteral in 9 cases and unilateral in 2 cases; of the 9 bilateral cases there were 3 craniopharyngiomas, 2 cortical tumours, 2 pineal, one 3rd ventricular and one corpus callosum tumour; of the 2 unilateral dilatations one was on the left side due to a craniopharyngioma and one on the right side due to pineal teratoma pressing on the midbrain. In all bilateral cases there was associated post-papillœdemic optic atrophy with very poor light perception. These patients were all either drowsy or almost completely unconscious. Pupillary reflex to light was absent in all cases. They all had markedly increased intracranial tension.

(*b*) Infratentorial tumours: There has been eight cases of this type in this series, seven cerebellar tumours and one 4th ventricular tumour. All these cases had bilateral post-papillœdemic atrophy, and were completely blind, very poor if any light reflex and were drowsy and some almost completely unconscious.

2. Trauma: In this group there were only 2 cases, both with bilateral dilatation of pupil with sluggish light reflex and they were unconscious. In one of these, there was no external injury, but had severe concussion and laceration of the brain. In the second case, there was a depressed compound fracture of the frontal bone with laceration of the dura and the brain.

3. In the inflmmatory group there were four cases. Two of these were influenzal meningo-encephalitis, one tubercular meningitis and one syphilitic meningo-encephalitis. In all these cases the pupils showed marked dilatation, one case was semi-conscious, 2 had marked papillœdema and one post-papillœdemic atrophy. In the syphilitic case the right pupil was dilated, reacted to light sluggishly, but the fundus was normal, and had 3rd and 4th nerves involved in addition.

4. The degenerative group had three cases of Schilder's disease with extensive demyelination and increased intracranial tension.

5. Of the cerebrovascular accidents admitted in the wards there has been during the period under survey only one case of cerebral hæmorrhage who had bilaterally dilated pupils. He was admitted unconscious with right hemiparalysis. C. S. F. was found to contain blood at every lumbar tap. Postmortem revealed hæmorrhage from the internal capsule vessels spreading into the left lateral ventricle and 3rd ventricle.

6. There have been 2 cases of congenital hydrocephalus in children below 3 years of age who showed bilaterally dilated pupils with optic atrophy. Both these children were semiconscious and showed signs very much like decerebrate rigidity.

An analysis of these cases brings out the facts that bilateral dilatation of pupils is associated with derangement of consciousness, and increased intracranial ten-

sion which often leads to failure of vision. These are explainable when the mechanism of pupillary dilatation is dealt with.

The Mechanism of Dilatation

The size of the pupils depends on the activity of the iris. Iris is made up of muscular tissue of ectodermal origin. It has in it two types of fibres: (*a*) circular ones which act like a sphincter and reduce the size of the pupil and (*b*) those arranged radially which dilate the pupil. The radial or dilatory fibres are attached on one side to the sphincter fibres and on the other to the ciliary body and when they act they pull on the circular fibres and dilate the pupil. Ordinarily the sphincter fibres are more powerful in action than the dilator fibres and hence the pupil is kept rather contracted.

The sphincter fibres are supplied by the parasympathetic or cholenergic fibres (Duke Elder, 1932). The whole neural mechanism of pupillary control is illustrated in Figs. 1 and 2 and the path of light reflex in Fig. 3. The parasympathetic pathway (Fig. 1) for

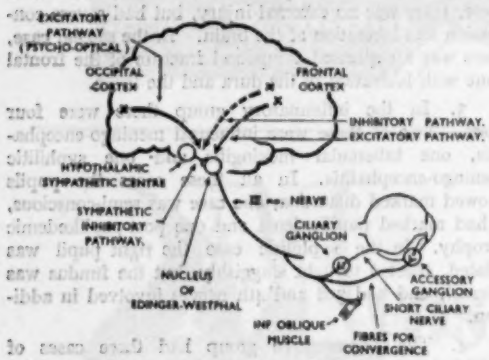

FIG. 1

pupil begins at the Edinger Westphal (E.W.) nucleus in the midbrain. The pupilloconstrictor fibres travel peripherally in the 3rd nerve trunk situated in the anterior part of the cavernous sinus. When traversing the superior orbital fissure they may occupy a superior and independent position. Some of these fibres are relayed in the ciliary ganglion from where they pierce the sclera around the optic nerve as the short ciliary nerves. The cortical connections of the pupillary system have been traced to an area in the occipital lobe (Barris, 1936; Clark, 1932) adjacent to the striate area (Fig. 1). Stimulation of this area causes constriction of the pupil bilaterally. Pupillary dilatation (Ranson and Magoun, 1933; Ury and Oldberg, 1940; Carlson Gillhorn and Darrow, 1941; Weinstem and Bender, 1941) is obtained by stimulation of some areas in the frontal lobe. This is due to the inhibitory effect of this area on the pupillary constriction centre in midbrain, rather than the stimulation of any dilatory centre. Associated with this, in the frontal lobe there is also a region which when stimulated produces constriction (Hodes and Magoun, 1942) of the pupil. It would appear, therefore, that the constrictor centre, the nucleus of Edinger Westphal receives excitatory impulses from the occipital lobe and excitatory and inhibitory impulses from the frontal cortex.

The sympathetic system (Fig. 2)—The pupillary sympathetic centres are situated in the hypothalamus. From this centre inhibitory pathway travels to the cons-

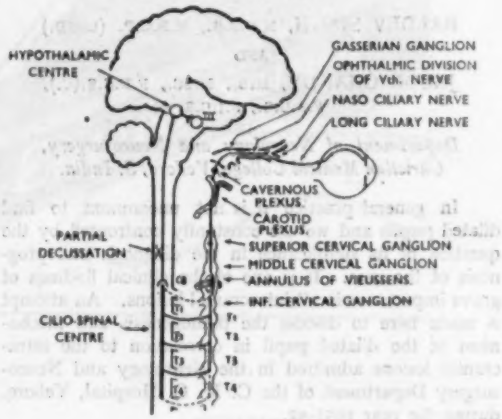

FIG. 2

trictor centre. The first neuron of the main efferent pathway runs down the brain stem suffering a partial decussation as it travels to the ciliospinal centre in the anterolateral tracts of the spinal cord. From the ciliospinal centre the second neuron leaves the cord by the anterior spinal roots, mainly T1 to T3 and possibly also C8 to T4. Thence the fibres travel up the cervical sympathetic chain *via* inferior and middle cervical ganglia and find a relay station in the superior cervical ganglion. The 3rd neuron of postganglionic fibres terminates in a complex network in the iris.

The sensory part of the arc, the light reflex which affects the pupil is represented in Fig. 3. It is believed that for pupillary light reflex the end-organs are in the retina which send stimuli by an independent set of non-medullated big fibres in contrast to visual fibres which are thin and are medullated. These fibres run through the optic nerve, decussate at the optic chiasma are relayed in the pretectal nucleus (P. T.) situated in the transitional area between the thalamus and midbrain, then they get to the Edinger Westphal nucleus of either

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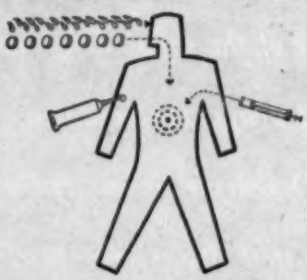

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side and from there back to the pupil. It is, therefore, possible by this mechanism to get active light reflex whilst otherwise the patient is blind. There is, however, one fallacy still possible. The iris in some individuals being directly sensitive to light shows a faint

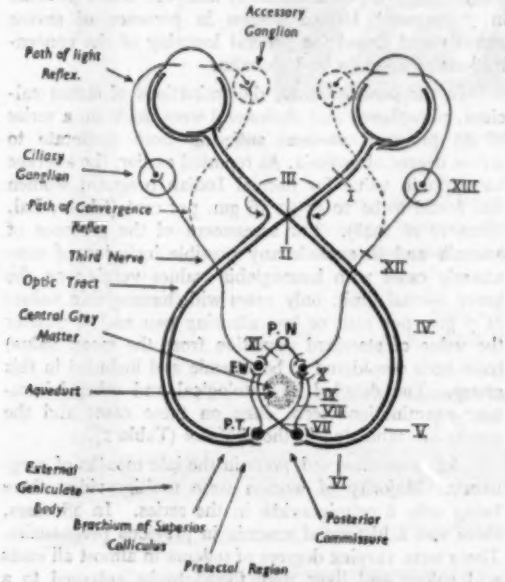

FIG. 3

light reflex even though the sensory arc may not be functioning and may be completely damaged.

COMMENTS

It is clear from the mechanism of pupillary control described that the pathological dilatation of pupil can be due to several types of lesions at various levels and they may be present individually or in combination. Increased intracranial tension may be the primary cause for the derangement of consciousness at its various levels and may simultaneously affect the pupillary dilating mechanism at various sites. In the first group of supra and infratentorial tumours the dilatation of pupils was for most of the cases secondary to post-papillœdemic atrophy, thereby damaging the sensory arc of the light reflex in addition to fibres of light perception. In pineal tumours it may have been also a direct damage to the pupillary constrictor centre, at the nucleus of Edinger Westphal, and releasing the sympathetic fibre mechanism causing dilatation. In cerebral tumours the dilatation could be augmented by either paralysing the stimulatory area in occipital or frontal lobes or stimulating the inhibitory area of the frontal lobe. The 3rd ventricular and subcallosal tumours could easily stimulate the inhibitory activity due to their proximity to the hypothalamic pupillary centre. In craniopharyngiomas dilatation may be due to the optic atrophy, whilst the teratoma of the pineal body may have pressed on the midbrain to compress the 3rd nerve to cause paresis or paralysis and produce dilatation of pupil. The traumatic cases illustrate, in the first case, the effect on both cerebral and midbrain centres, and the other with depressed fracture of frontal bone injury to the pupillary centres in the frontal lobe.

In Schilder's disease the pupil is affected both by damage to cerebral centres as well as by post-papillœdemic atrophy. In meningitis the pupillary change is due to the 3rd nerve being caught up and damaged by the scarring of the meninges and by the direct effect of increased intracranial tension at various levels.

In the case of cerebral hæmorrhage the dilatation of the pupil was due to the blood permeating in the subthalamic region. In cases of hydrocephalus, dilatation is due to the floor of 3rd ventricle compressing the optic chiasm and nerves, producing optic atrophy.

Ever since the times of Robert Whytt (1751) who first described the fixed dilated pupils, this condition has been considered to indicate a serious situation so far as the diagnosis and prognosis are concerned. This fact has been found to be consistently true in the cases quoted above. It is important to realise that there is not much lateralising value in the clinical picture of fixed dilated pupils.

SUMMARY

A clinical survey of cases with dilated pupils admitted in the C. M. C. Hospital, Vellore, for the year 1951-52 has been made.

Six types of pathological lesions have been encountered and they have been described.

The mechanism of dilatation of pupils has been illustrated and explained.

The way these six types of lesions bring about dilatation has been dealt with.

Prognostic assessment of serious import based on this feature of dilated pupils in intracranial lesions has been reiterated.

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STUDIES ON METABOLISM OF CALCIUM, INORGANIC PHOSPHORUS AND CHOLESTEROL IN PREGNANCY WITH ANÆMIA

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The anæmia in pregnancy is one of the major obstetrical problems in India. The incidence in India has been observed differently by different workers, probably on account of different socio-economic and dietetic factors and of different hæmoglobin levels accepted as standards. Mitra (1942) accepting 9·5 gm. as the minimum normal hæmoglobin in pregnancy studied 16,985 pregnant women, admitted in Chittaranjan Seva Sadan during the years 1927-1937 and found the incidence of anæmia was 2.24 per cent and in the same series he observed that anæmia, either directly or indirectly accounted for about one-third (32·8 per cent) of total maternal deaths. This high maternal mortality rate due to anæmia, is one of the many problems which must be tackled in order to improve the maternal mortality to any appreciable degree.

Among many ætiological factors, dietetic deficiency has been considered to be the most important. Iron, is usually in short supply in presence of heavy demand made by the growing fœtus and its metabolism is essentially altered. While there is deficiency in one important mineral i.e., iron, chances are that there may be deficiencies in the supply of other none the less important minerals, notably calcium and phosphorus and also of essential proteins and fat in the diet. The normal metabolism of all these different constituents in the diet is so much interdependent that any deficiency or altered metabolism in one is usually reflected on the rest and the whole physiological process of metabolism is thrown out of gear.

Strauss and Castle (1933) on a study of 36 pregnant women with severe degree of anæmia having hæmoglobin values less than 6 gm. per cent concluded that the common hypochromic anæmia of pregnancy is due to either a direct dietetic deficiency or a deficiency caused by achlorhydria or hypochlorhydria or associated defects interfering with normal metabolism of iron. Coons (1932), Davidson and Fullerton (1938) on a study of iron balance in pregnancy found in many cases a negative iron balance or just on the borderline of iron starvation. Bethell *et al* (1939, 1943) emphasized the importance of an adequate protein diet for the prevention of anæmia and showed a relation between the incidence of microcytic anæmia in pregnancy and a diet deficient in protein. They also stressed the importance for a good reserve of iron before pregnancy begins and showed the relationship between severe hypochromic anæmia in pregnancy and a diet deficient in iron.

Observations on the estimations of minerals, protein and fat in the maternal circulation in pregnancy anæmia cases are very meagre in India. Mitra (1937) observed blood calcium in 4 cases and blood cholesterol in 8 cases of anæmias in pregnancy. All cholesterol values were lower than normal. Chatterjee and Ghose (1940) and Nayar (1942) studied the cholesterol metabolism in some pregnancy cases in presence of anæmia. Chakraborty (1948, unpublished data) analysed blood proteins in 7 pregnant Indian women in presence of severe anæmia and found the general lowering of the concentrations of albumin and globulin.

In the present study, determinations of serum calcium, phosphorus and cholesterol were made on a series of 44 pregnant women, suffering from moderate to severe degree of anæmia. As reported earlier, the average hæmoglobin value for normal Indian pregnant women was found to be 10·51 ± 1·56 gm. per cent (Ghose, Lal, Mitra *et al* 1948). For assessment of the presence of anæmia and to exclude any possible inclusion of non-anæmic cases with hæmoglobin values verging on the lower normal limit, only cases with hæmoglobin values of 7 gm. per cent or less allowing two and a quarter the value of standard deviation from the mean value) have been considered to be anæmic and included in this group. The detailed hæmatological and other laboratory examinations were done on these cases and the results are tabulated in the protocol (Table 1).

All cases observed, were in the late months of pregnancy. Majority of women were multigravidæ, there being only 6 primigravidæ in the series. In 28 cases, there was a history of anæmia in previous pregnancies. There were varying degrees of œdema in almost all cases and spleen and liver were found to be enlarged to a varying degree in 27 and 21 cases, respectively. Urine showed traces of albumin in 6 cases and moderate amount in 11 cases, one showed the presence of granular casts as well. Hookworm infection was present in 7 cases and Kahn test was positive in 4 cases (in 8 cases Kahn test was not done). van den Bergh's test gave an indirect positive reaction in 22 cases. Of these in 8 cases the bilirubin content was within normal limits. The cases are classified into different types of anæmias according to their values of mean corpuscular volume and mean corpuscular hæmoglobin concentration. In the conjoined study (Ghose, Lal, Mitra *et al*) the corresponding normal values for Indian pregnant women were found to be 81·30 ± 7·87 and 31·61 ± 2·50 respectively as against 86·83 ± 10·08 and 30·57 ± 2·13 observed by Napier and Das Gupta (1942). According to their findings of the normal, Napier and Das Gupta classified normocytic group where mean corpuscular volume ranged between 75 and 100 and values less than 75 were classified as microcytic and values above 100 as macrocytic. According to our own observations (*loc. cit.*), the above range has not been adhered to but values between 73 and 90 along the lines mean ± standard deviation of normal value, has been taken as the normal normocytic range and according to this range the cases here have been classified. Similarly for mean corpuscular hæmoglobin concentration, the range of 29-34 per

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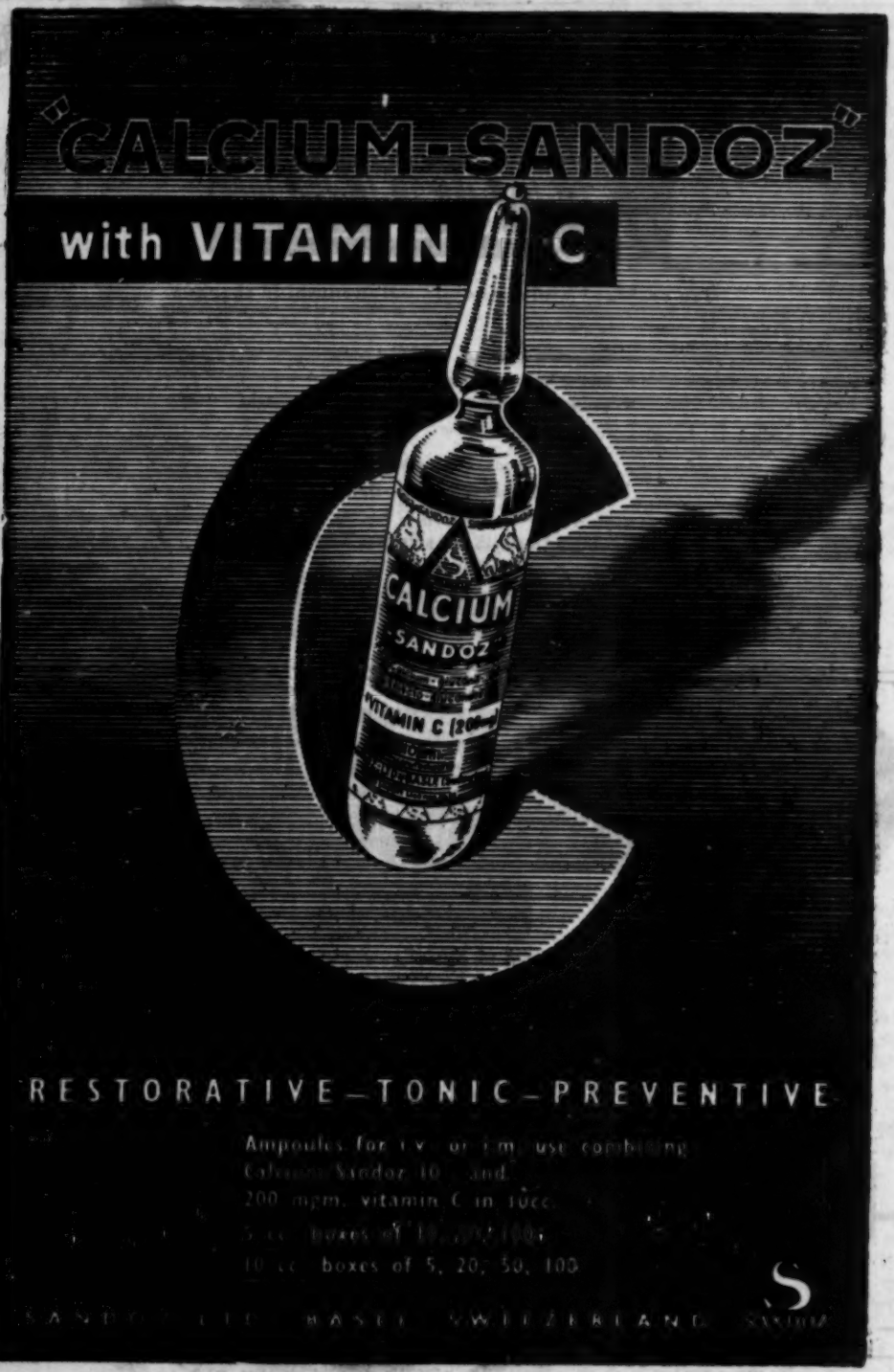
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TABLE I—PROTOCOL OF CASES.

Serial No.	Age	Month of pregnancy	Previous pregnancy	Previous history of anæmia	Duration of illness (weeks)	Oedema	Spleen	Liver	Urine Albumen	Stool	Kahn	van den Bergh	R.B.C. in million	Hb in gm.	M.C.V.	M.C.H.	M.C.H.C.	Ca mgm%	pH mgm%	Ca × pH Product	Free cholesterol mgm %	Ester Cholesterol mgm %	Total Cholesterol mgm %
1.	26	9	4	Yes	6	M	P^2	P^1	Nil	Nor	Neg	Neg.	2.66	4.53	65.6	17.0	26.0	10.0	4.0	40.0	90.0	85	175
2.	22	8	3	..	-	M	P^2	P^1	Nil	,,	,,	,,	3.20	6.73	68.1	21.1	30.9	10.4	4.2	43.68	78.0	88	166
3.	17	8	0	No	5	S	o	o	Nil	,,	,,	Ind. 1.2	0.70	3.02	136.2	42.8	31.1	9.1	3.8	34.58	76	72	148
4.	22	7	2	No	4	S	P^1	o	Nil	,,	,,	Neg.	2.57	6.87	65.3	25.7	39.4	9.2	2.8	25.76	90	85	175
5.	28	7	6	Yes	8	M	P^1	P^1	Tr	,,	,,	,,	3.30	6.32	69.3	19.1	27.7	9.7	3.67	35.6	85	145	230
6.	28	9	4	Yes	8	G	P^1	o	Nil	,,	,,	,,	1.34	3.45	86.2	24.4	28.2	9.2	5.2	47.8	46	90	136
7.	26	7	1	No	4	M	P^1	o	Tr	HW	,,	Ind. .4	0.82	3.20	124.6	32.4	26.8	10.0	4.9	49.0	58	40	98
8.	35	8	8	Yes	8	G	P^2	P^1	Nil	Nor	,,	Neg.	1.32	3.44	88.7	23.8	28.6	9.6	4.8	46.0	56	68	124
9.	19	8	0	No	3	S	o	o	,,	,,	,,	,,	1.40	4.58	109.2	32.5	29.6	10.1	3.2	32.3	90	70	160
10.	20	9	0	No	4	S	P^1	P^1	,,	,,	,,	,,	3.34	6.87	75.1	20.6	27.4	9.4	2.5	23.5	74	104	178
11.	23	9	2	No	6	S	P^1	P^1	D.P.	,,	—	,,	2.99	6.86	83.8	23.0	27.6	9.42	4.1	38.6	82	93	175
12.	24	8	1	No	6	M	o	o	Tr	,,	,,	,,	0.95	2.75	112.4	27.6	24.2	9.2	4.1	37.72	41	58	99
13.	22	7	2	Yes	4	M	P^1	o	D.P.	,,	,,	Ind .8	1.20	4.50	120.2	38.6	35.2	8.7	4.3	37.41	78	89	167
14.	32	7	8	Yes	10	G	P^2	P^2	Nil	,,	,,	,, .11	1.50	4.50	86.2	29.4	35.2	8.9	3.8	33.8	48	58	106
15.	18	9	0	No	4	S	o	P^1	Tr	HW	,,	Neg	2.72	6.46	82.6	23.4	27.2	9.9	3.45	34.1	124	76	200
16.	20	9	0	No	6	S	P^1	P^1	Nil	HW, St	,,	Ind 1.2	1.01	3.02	118.7	29.9	25.2	9.0	3.20	28.8	72	49	121
17.	24	7	2	Yes	8	M	P^2	P^2	,,	Nor	,,	,, .4	2.39	4.81	79.8	20.1	25.2	9.8	4.44	43.5	71	56	127
18.	18	9	1	Yes	6	S	P^1	P^2	,,	HW	,,	Neg	3.41	6.87	76.4	20.1	26.3	8.3	3.4	28.2	60	98	158
19.	23	8	2	No	4	S	P^2	P^1	D.P.	Nor	S.P.	Ind .4	2.79	6.73	80.1	24.2	30.2	9.62	5.71	54.9	95	123	218
20.	24	8	3	Yes	4	M	o	o	Nil	,,	Neg	Neg	1.71	5.22	115.8	30.4	26.4	8.8	4.3	37.8	54	82	136
21.	25	9	3	Yes	5	S	P^1	o	,,	—	,,	Ind .4	1.17	3.43	110.9	29.3	26.3	9.6	3.9	37.4	83	49	132
22.	22	7	2	Yes	8	M	o	P^2	,,	HW, RW	,,	,, .5	2.50	5.63	87.6	24.5	33.4	9.0	3.25	29.2	37	75	112
23.	30	8	6	Yes	10	G	P^2	P^2	D.P.	Nor	,,	Neg	2.34	4.26	69.9	18.2	26.1	10.7	3.2	34.2	88	117	205
24.	28	7	0	No	4	S	o	o	M.P.	,,	,,	,,	2.91	5.5	67.4	18.9	28.0	9.2	4.52	41.5	138	172	310
25.	27	8	4	Yes	4	S	P^1	P^2	Nil	,,	—	Ind .5	1.26	4.12	120.6	37.4	31.8	9.4	4.8	45.1	48	77	125
26.	22	9	2	Yes	4	M	o	o	,,	,,	—	Neg	2.50	5.5	90.6	22.2	24.3	10.4	4.2	43.6	82	80	162
27.	21	8	4	Yes	6	S	o	o	,,	,,	—	Ind .4	1.51	5.5	110.3	36.8	33.6	10.2	3.9	39.7	28	58	86
28.	20	9	2	No	5	o	o	o	,,	,,	Neg	,, .5	1.10	2.4	146.2	26.1	19.4	9.8	5.35	52.4	52	76	128
29.	36	9	8	Yes	12	S	o	o	M.P.	,,	,,	Neg	2.69	6.18	72.9	23.0	31.5	9.0	4.2	37.8	126	127	253
30.	26	7	4	Yes	8	G	P^2	P^1	Nil	Tri	Neg	Neg	2.77	3.85	55.0	13.8	25.3	10.9	4.65	50.6	55	28	83
31.	29	8	6	Yes	4	S	o	o	,,	Nor	,,	Ind .6	1.70	5.05	114.2	31.8	27.8	9.2	3.8	34.9	46	66	112
32.	30	8	6	Yes	6	M	P^1	o	,,	,,	—	,, 3.5	1.36	4.75	118.8	34.6	29.1	8.8	4.75	41.8	72	56	128
33.	23	7	3	No	8	S	o	o	D.P.	HW	S.P.	Neg	2.63	5.77	82.9	23.0	26.5	8.65	6.10	52.7	68	84	152
34.	32	8	5	Yes	8	M	P^1	o	Tr	Nor	—	Ind .4	.94	3.6	124.0	32.4	27.4	10.0	5.2	52.0	58	60	118
35.	25	9	4	Yes	8	M	P^1	P^1	D.P.	,,	Neg	,, 1.2	.75	2.12	142.6	25.8	19.2	7.8	3.8	29.6	42	68	110
36.	24	8	3	Yes	4	O	P^1	o	Nil	,,	,,	,, 1.2	1.3	2.6	116.2	30.2	26.4	8.8	5.35	47.0	40	116	156
37.	36	9	7	Yes	10	G	o	o	,,	,,	—	,, .8	1.55	4.6	132.8	33.4	27.5	9.5	4.3	40.8	70	120	190
38.	28	8	3	No	4	S	o	o	D.P.	Tri	W.P.	,, .5	1.93	6.5	104.5	34.9	33.4	8.8	3.8	33.4	110	165	275
39.	26	7	4	Yes	4	S	P^2	P^1	Tr	Nor	Neg	,, .4	2.64	5.5	70.2	20.8	29.7	9.0	3.7	33.3	64	46	110
40.	18	9	0	No	6	G	o	o	D.P.	,,	,,	,, .5	.82	3.1	143.8	38.8	25.7	9.0	3.4	30.6	73	49	122
41.	24	8	4	Yes	4	S	P^1	P^1	D.P.	,,	,,	,,	2.13	4.12	77.2	19.3	25.3	10.8	2.75	29.7	82	50	132
42.	32	7	8	Yes	7	M	P^2	P^2	Nil	,,	,,	,,	3.40	6.87	70.5	20.2	28.7	9.9	2.85	28.2	88	67	155
43.	20	8	1	No	5	S	P^1	o	,,	,,	—	Ind .6	1.31	4.01	113.4	31.2	28.2	7.4	3.8	28.12	92	68	160
44.	28	9	7	Yes	8	S	o	P^1	,,	HW	W.P.	Neg	3.3	6.18	62.8	18.8	29.9	10.4	4.64	48.2	60	112	172

N.B.—Oedema—Not present o; Slight—S; Moderate—M; Severe—G. *Spleen and Liver*—Not palpable o; Palpable 1 finger—P^1; Palpable 2 fingers—P^2; Palpable 3 fingers—P^3. *Albumen*—Not present—o; Trace—Tr.; Distinct present—D.P.; Moderately present—M.P.; Heavily present—H. P. *Stool*—Hookworm—HW; Strongyloides—St; Round worm—RW; Normal—Nor. Trichuris Tri. *All the cases were Hindus except Nos. 11, 16, 19, 24 and 38 who were Mahommedans.*

cent has been considered to represent the orthochromic type and values less than 29 and greater than 34 to represent hypochromic and hyperchromic types, respectively.

According to the above standards the cases were distributed into the following hæmatological groups—

	Hyper-chromic	Ortho-chromic	Hypo-chromic	Total
Macrocytic ...	1	11	8	20
Normocytic ...	2	6	5	13
Microcytic ...	1	2	8	11

Thus it will be seen from above that anæmia due to deficiency of hæmopoietic principle alone was limited to 12 cases in the macrocytic hyperchromic and orthochromic groups or in about one-fourth of the observed cases. Deficiency of both iron and hæmopoietic principle was present in 8 cases in the macrocytic hypochromic group (dimorphic anæmia) whereas pure iron deficiency was present in the rest of the cases or normocytic and microcytic groups, though a few of the dimorphic variety may be included here. The dimorphic variety has been given now-a-days a distinct clinical entity as against the previous conception of macrocytic and microcytic types denoting deficiency of hæmopoietic principle and iron, respectively.

For purpose of biochemical study the cases have been divided into two main groups: Group A, consisting of the normocytic and microcytic types and Group B, consisting of the macrocytic type, irrespective of their mean corpuscular hæmoglobin concentrations. The mean hæmoglobin and red cells in Group A and B were 5·5 gm. and 3·9 gm., 2·6 m. and 1·2 m., respectively.

The methods of estimations of serum calcium, phosphorus and cholesterol and their mean values at different periods of normal gestation have already been reported (Ghose, 1951, 1952).

Serum Calcium

The results of determinations of serum calcium of 24 cases in Group A and 20 cases in Group B are presented in Table 2 and graphically represented in

Table 2—Calcium, Phosphorus and Cholesterol in mgm./100 c.c. of Serum in Anæmia in Pregnancy, During the Third Trimester

	Group A (Microcytic; Normocytic 24 cases) Range Min.	Max.	Mean	Group B (Macrocytic—20 cases) Range Min.	Max.	Mean	Normal mean
Hæmoglobin			5·5	...	...	3·9	10.51 ± 1.56
Red blood cells			2.6	...	...	1.2	4.17 ± 0.56
Calcium ...	8.3	10.9	9.64 ± 0.7	7.4	10.2	9.16 ± 0.72	9.86 ± 1.0
Phosphorus ...	2.5	6.1	4.01 ± 0.92	3.2	5.35	4.19 ± 0.66	4.05 ± 0.9
Calcium phosphorus product ...	23.5	54.9	38.5 ± 8.85	28.12	52.4	38.4 ± 7.47	40.12 ± 9.82
Free cholesterol ...	40	138	78.73 ± 24.9	30	110	64.25 ± 20.83	96.0 ± 28.4
Ester cholesterol ...	27.5	172	88.54 ± 33.04	40	165	74.25 ± 29.74	120.89 ± 40.4
Total cholesterol ...	83	310	167.3 ± 52.78	86	275	138.5 ± 41.31	250.64 ± 70.6

Fig. 1. As all determinations were made on anæmia cases during the last trimester of pregnancy, their mean values are compared to the corresponding value in normal pregnancy.

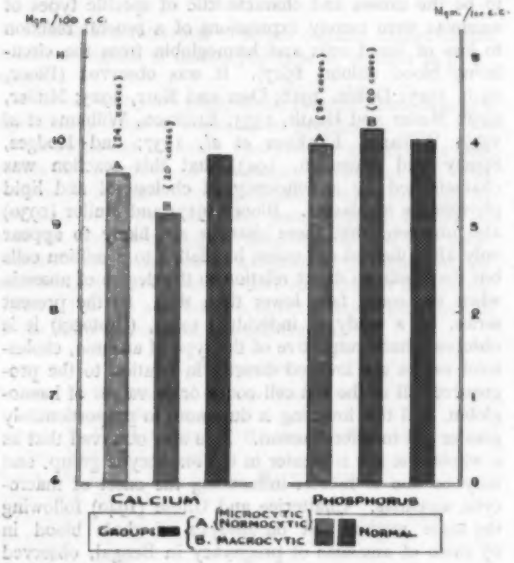
It is seen that the mean value of serum calcium in Group A is practically identical with the normal value in pregnancy showing only a decrease by 0·22 mgm. But in the macrocytic group (Group B), the mean value of 9·16 mgm. is significantly lower than the normal value and the fall in concentration is by 0·70 mgm. or about 7 per cent. The range of variations in both the groups was rather limited when compared to the normal group.

Serum Phosphorus

The mean values of the 2 groups are compared to the normal value during the last trimester in Table 2 and Fig. 2.

It is found that the value in Group A is identically similar to the value in the normal group and the value

in Group B is slightly higher than the normal but does not bear any significance.



FIGS. 1 AND 2—SERUM CALCIUM AND INORGANIC PHOSPHORUS IN ANÆMIA IN PREGNANCY DURING THE LAST TRIMESTER

CALCIUM PHOSPHORUS PRODUCT

It will be seen from the observed mean values of the product of calcium and phosphorus in Table 2 that they do not practically vary and the difference between them is only 1·7, though both are somewhat below the normal average value. No significance could be attached to this observation.

SERUM CHOLESTEROL

Total cholesterol and its free and ester fractions were determined in all the cases and the mean values of the two groups for each of them are presented in Table 2 and represented graphically in Fig. 3.

Free cholesterol was low in both the groups and the percentages of fall in group A and B were about 18 and 33 respectively when compared to the normal value and both are found to be significant. The significance of the fall in group B is higher than that in Group A.

Ester cholesterol is also significantly diminished in both the groups and the percentages of fall which are higher than those of the free fraction were 26 and 35 for group A and B, respectively. The changes observed in both values are highly significant.

The net results of the decrease in free and ester fractions are significantly manifested in the concentration of total cholesterol and the percentage of fall recorded for groups A and B were 33 and 45 respectively. The changes observed in both values are also of high significance.

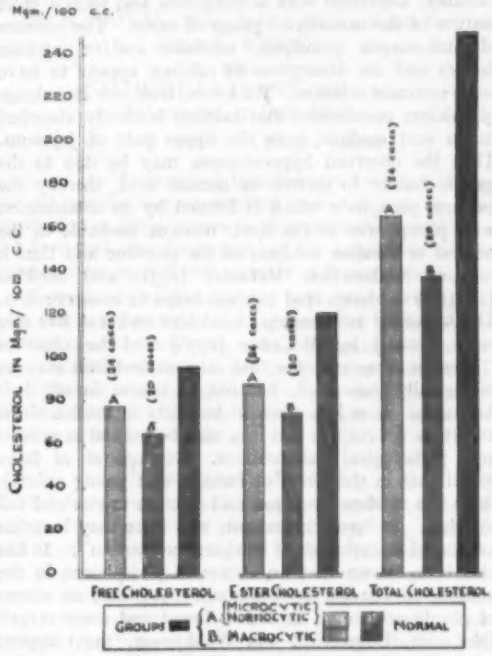


FIG. 3—SERUM CHOLESTEROL IN ANÆMIA IN PREGNANCY DURING THE LAST TRIMESTER

To summarise, there is a very much significant fall in the value of total cholesterol, more so in the macrocytic group, which is caused by significantly greater fall in the value of its ester fraction than in the value of its free component and the ratio of free to total cholesterol is increased to 0·46 in both the groups, compared to 0·38 in the normal. Thus it is seen that the difference in fall between the two groups is only a question of degree, being higher in the macrocytic groups. The type and pattern of change are similar in both groups.

DISCUSSION

The correlation between iron metabolism on the one hand and calcium and phosphorus metabolism on the other is not definitely known. The deficient supply of calicum and phosphorus, as a result of a probable deficient supply of iron in the foods does not appear to be the cause as there is no lowering of calcium and phosphorus levels in blood in the microcytic and normocytic groups. The lowering of the blood calcium in the present macrocytic group may either indicate a gross, deficiency of calcium supply and with it, the extrinsic factor supplied through diets or in absence of such deficiencies in either of them, the effect may be due to the usual appreciable lowering of the gastric acid-

ity in these cases. The relative deficiency or absence of the intrinsic factor as well, is usually, though not invariably, associated with achlorhydria and form a chief feature of the macrocytic group of cases. The absence of anti-anæmic principles, extrinsic and/or intrinsic factors and the absorption of calcium appear to have some common relation. We know, from our knowledge of calcium metabolism that calcium is chiefly absorbed in an acid medium from the upper part of jejunum. Thus the observed hypocalcæmia may be due to the gastric failure to secrete its normal acid, thereby the calcium phosphate which is formed by its combination with phosphorus of the food, remains insoluble in the neutral or alkaline medium of the intestine and thus it remains unabsorbed. McLester (1931) and Sheldon (1934) have shown that calcium helps to conserve iron. The biological relationship of calcium and iron has also been stressed by McCance (1936) and he observes "There is some evidence that calcium and iron may be biologically associated, but not of course in all their functions. Iron is a constant impurity in marine shells and there is evidence that iron may be present in normal and pathological calcifications. Ramage *et al* have found that in the livers of fœtuses and young animals there is a tendency for iron and calcium to rise and fall together. In hæmochromatosis also there may be some associated disturbance of calcium metabolism". It has also been shown that an excess of phosphorus in the absence of vitamin D (Diamond, 1935) and an excess of phytic acid, e.g., in brown bread and some cereals (McCance, Edgecombe and Widdowson, 1943) appear to hinder iron absorption. Indian diets, consisting mostly of cereals, contain an excess of phytic acid or phytin which may also explain the lowering of calcium and frequency of anæmias due to less absorption of iron, particularly in the absence of normal gastric acidity. On the above arguments, serum phosphorus also should show some reduction in its value in the macrocytic group but such has not been observed in the present series. The exact cause is very difficult to explain. The calcium phosphorus product in the macrocytic group has been observed to maintain practically the normal value, inspite of the fall of calcium.

Cholesterol metabolism has been studied by various other observers in cases of anæmia, but the studies on anæmias in pregnancy are more limited. There is uniformity of opinion that serum cholesterol is lowered in anæmias. We know that both red blood cells and plasma contain cholesterol but in red cells, practically the whole of cholesterol is in the free form whereas the plasma contains both, ester fraction predominating.

Early observers claimed that by characteristic lipid pattern certain types of anæmias could be differentiated from one another and they even suggested that disturbances of lipid metabolism resulted in some anæmias, chiefly because of hæmolytic and antihæmolytic effects of phosphatides and cholesterol, respectively. With the recognition, that these functions of the lipids are restricted to particular conditions and with further study of concentration of cholesterol in different anæmic states, it was felt that the disturbances, which were considered to be the causes and characteristic of specific types of anæmias were merely expressions of a general reaction to loss of blood cells and hæmoglobin from the circulating blood (Bloor, 1917). It was observed (Bloor, 1916, 1917; Dubin, 1918; Oser and Karr, 1925; Muller, 1930; Muller and Heath, 1933; Erickson, Williams *et al* 1937; Williams, Erickson *et al*, 1937; and Hodges, Sperry and Anderson, 1943) that this reaction was characterised by a deficiency of cholesterol and lipid phosphorus of plasma. Bloor (1917) and Muller (1930) also observed that these changes are likely to appear only after the red cell count has fallen to 2 million cells but they bear no direct relation to the degree of anæmia when the count falls lower than this. In the present series, on a study of individual cases, (Protocol) it is observed that irrespective of the type of anæmia, cholesterol values are lowered directly in relation to the progressive fall in the red cell count or in values of hæmoglobin, and this lowering is due more to proportionately greater fall in ester fraction. It is also observed that as a whole, the fall is greater in the macrocytic group, and may be due to factors influencing the onset of macrocytic anæmias. Chatterjee and Ghose (1940) following the same method and on analysis of whole blood in 27 cases of anæmias of pregnancy in Bengal, observed lowered cholesterol values, with remarkable diminution of ester cholesterol fraction and with slight alteration in values of free cholesterol. In the present series, however, it is found that free cholesterol also diminishes though to a lesser extent. Nayar (1942) also found low cholesterol values in anæmia of pregnancy cases, irrespective of the type of anæmia. She observed no direct relation of blood cholesterol values with the red cell count and hæmoglobin concentration of blood. This author, however, did not estimate, free and ester fractions separately.

The few cases in this series that showed high cholesterol values were complicated by other associated pathological conditions, e.g., albuminuria and nephrosis or chronic nephritis. The writer believes that the hypocholesterolæmia observed in the anæmias in pregnancy is neither wholly a cause nor the effect of anæmia as such but probably the anæmia and hypocholesterolæmia both owe their origin to a common cause, at least during the initial stage of anæmia, which if of long standing might cause a further decrease in the concentration of cholesterol in blood due to the dysfunction of hæmopoietic organs. Initially, the supply of cholesterol may be deficient and there is a probability of deficient absorption on account of altered gastric and pancreatic secretions. After absorption, liver is the main organ that is concerned in the regulation, storage, esterification, synthesis and destruction of the cholesterol. And it is known that in severe degrees of anæmia the liver functions suffer and this organ fails to deal with the normal metabolism of cholesterol. Thus there is less storage

and synthesis. This is aggravated by the demands made by pregnancy.

Conclusion

There is a reduction in serum calcium concentration in severe degrees of macrocytic type of anæmia in pregnancy.

Serum inorganic phosphorus concentration does not significantly alter in anæmias in pregnancy.

A reduction in serum cholesterol concentration also occurs in anæmias in pregnancy. The fall in total cholesterol is caused by significant lowering of both its free and ester fractions, the percentage of fall in its ester fraction being higher than that of the free component. The total fall is insignificantly higher in the macrocytic type of anæmias than in normo or microcytic types. The fall also bears a direct relation with the fall in the hæmoglobin and red cell counts.

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DISTRIBUTION OF BLOOD GROUPS (A, B, O AND AB) IN RAJASTHAN

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Since the discovery of blood groups by Landsteiner and his pupils various workers have worked on the distribution of blood groups in their respective countries. The fact that the frequency of the respective blood groups varies in different races is well established.

India is a vast country and is peopled by different races. It is natural that the percentage of blood groups in various areas will vary. The percentage of blood groups in Rajasthan has not been worked out up to now, hence it was thought necessary to determine their distribution in this State as a pre-requisite to the establishment of a blood bank.

Material and Method

Six hundred persons belonging to various districts in Rajasthan have been grouped. They were selected at random without any regard to their financial condition, caste and customs. However, it was ensured that women should form a good percentage of this series. They form approximately 48 per cent of all cases (probably the largest percentage of females included in any series of this type of investigation). Most of our cases came from the Sawai Man Singh Hospital, Jaipur and the State Zenana Hospital, Jaipur. Some of them were students of the S. M. S. Medical College and a few came from the Central Jail, Jaipur.

We used the Tile Method of blood grouping. This is a handy and easy method for a small number of cases. Results are clear cut and unmistakable by naked eye. They were, however, checked by using a magnifying lens and microscope.

Stock sera from blood groups A and B were obtained from Haffkine Institute, Bombay, each ampoule containing 1 c.c. of the serum. As suggested by Rosenthal these sera contained such preservatives as to give them distinctive colours. To each c.c. of group A serum were added 0·01 c.c. of 1 per cent neutral acriflavin and 0·01 c.c. of 0·5 per cent basic fuchsin. To each c.c. of group B serum was added 0·01 c.c. of 1 per cent aqueous solution of brilliant green.

Precautions

1. The red cell suspension was always used fresh (within 1—3 hours of its preparation).

2. The red cell suspension was never stronger than 2 per cent.

3. The droppers, pipettes and glass rods were sterilised before use.

4. No batch of grouping sera was used unless it was proved to be highly sensitive at the time of use.

5. Control R. B. C.'s of known blood group were always included in each batch.

The results of our investigation are given in Table 3.

Discussion

Landsteiner (1900) was the first to discover agglutinogens A and B in human erythrocytes. On this basis he divided the whole population into 3 blood groups A, B and O. Decastello and Sturli (both pupils of Landsteiner), in 1902, discovered the blood group AB which is a rare one. Jansky (1907) and Moss (1909) classified the blood groups into numbers 1, 2, 3 and 4. These different classifications caused confusion and were therefore given up. Landsteiner's classification (A, B, O group) is now universally accepted and is also labelled as the international nomenclature.

The first studies on racial blood groups were carried out by Hirschfeld and Hirschfeld (1919) during the First World War. They found that frequencies of blood groups varied in different people, depending to some extent on the geographical distribution of the countries of their origin. They were of the opinion that the percentage of blood group B increases and that of A decreases as one moves from West to East. These conclusions were not confirmed by subsequent workers (Table 1)

Table 1—Distribution of Racial Blood Groups in some Foreign Countries

S. No.	Population & Community	Investigators	Total No. of Cases	Blood Groups A	O	B	AB
1.	English (London)	Taylor & Ikin	1,073	42.0	45.9	9.3	2.7
2.	American Indians (full blood) Tacoma, Wash.	Landsteiner, Wiener & Matson	120	25.8	73.3	0.8	Nil
3.	American Indians (not pure)	Same authors	155	34.8	58.1	4.5	2.6
4.	U.S.A. (various centres) Industrial & Clerical Class (Whites)	Hervey *et al*	141,774	40.77	45.55	9.96	3.72
5.	U.S.A. (Whites) New York	Wiener & Sonn	1,077	37.9	41.7	13.9	6.6
6.	Denmark	Clausen	1,853	42.5	40.0	12.4	5.1
7.	Germans (Berlin)	Schiff	39,174	42.5	36.5	14.5	6.5
8.	Eskimos (Cape York, Thule, etc.)	Heinbrecker & Pauli	124	12.9	80.7	2.4	4.0
9.	Australian (aborigines)	Cleland	398	66.1	33.9	Nil	Nil
10.	U.S.A. (Negroes), New York	Wiener	189	26.4	48.1	22.8	2.7
11.	Chinese Hunan	Li-Chi-Pan	1 500	38.1	31.3	20.7	9.9
12.	Russians	Blinov	763	38.4	33.7	20.8	7.1
13.	Egyptians (Cairo)	Matta	516	35.7	26.6	27.1	10.5
14.	Douiret (Tunisia)	Caillon & Disdier	343	32.6	58.3	7.8	1.1
15.	Arabs (Baghdad)	Boyd & Boyd	500	30.8	34.1	28.9	6.2

Table 2—Showing Distribution of Blood Groups in Bengal and Assam

S No.	City or province and community	Investigators	Total No. of Cases	Blood Groups A	O	B	AB
1.	Hindus, various castes from U. P.	Malone & Lahiri, (1929)	2,357	24.5	30.2	37.2	8.1
2.	Calcutta (Indians)	Greval, Chandra and Woodhead (1939)	300	26.7	26.7	37.7	9.0
3.	Calcutta (Indians)	Greval & Chandra (1940)	1,638	22.5	35.03	34.9	7.9
4.	Calcutta (Anglo-Indians, I.M.D. Students)	Same authors	67	41.79	40.29	14.92	2.98
5.	Calcutta (Europeans)	Same authors	488	33.6	43.6	17.6	5.12
6.	Mahishya (Budge Budge, Bengal)	Macfarlane and Sarkar (1941)	160	20.0	32.5	39.4	8.1
7.	Malayalis (Lower Cochin)	Same author	260	29.3	48.1	16.1	6.5
8.	Plainsmen (Assam)	Mitra (1935)	2,000	24.6	33.7	32.5	9.2
9.	Angami Nagas (Assam)	Same author (1936)	165	38.8	46.1	11.5	3.6

Table 3—Showing Relation of the Present Investigation

S. No.	Population & Community	Total No. of Cases	Blood Groups A	O	B	AB
1.	Rajasthan Hindus and Mohammedans (men and women both)	600	24.5	32.5	35.84	7.16
2.	Women alone	286	26.9	34.29	31.8	7.0
3.	Men alone	314	22.3	30.9	39.5	7.4
4.	Mohammedans	34	26.4	26.4	41.1	6.0

who found that B group was more frequent in Egyptians, Chinese and American negroes but not in Tunisians (though Egypt and Tunisia are neighbours), American Indians, Australian aborigenes and Eskimos. In Nagas (Assam, India) and Malayalis (Lower Cochin, India) the group percentage is nearly as low as in Germans (Berlin). The B group is also as common in Russians as in Chinese and is less frequent among Europeans and Anglo-Indians residing in Eastern India (Table 2).

Recent workers are of the opinion that the percentage of blood groups in a population does not depend only on the geographical location of its country but also on the race to which it belongs.

In India Malone and Lahiri (1929) were the first to carry out a survey of the frequencies of different blood groups in Hindus of United Provinces (Table 2). They arrived at the following conclusions—

1. B group percentage was higher than that of any other group.

2. There were variations in blood group frequencies in the same race (Hindus).

3. Percentage of O group increases as one travels up the Ganges valley.

Subsequent workers Greval and Chandra (1940) in Calcutta and Mitra (1935, 1936) in Assam could not confirm the findings of Malone (Table 2). They observed (similar to our results in women) that percentage of O group was slightly higher than that of B.

B group was found high in our present investigation. This is in agreement with the figures given by some Indian workers with regard to Indians alone.

It was considered advisable to determine if the distribution of blood groups depends upon the sex factor to some extent just as E. S. R., total red cell count and hæmoglobin, etc., vary in females as compared with males, so it was arranged to include a large percentage of women in our present work. Apparently no worker has tried to find out the distribution of blood groups in women as compared with men. In women blood group B (31·8 per cent) is a trifle less than O group (34·29 per cent) but in men B group gives the highest frequency (39·5).

As is shown in the Tables 1 and 2 most of the Europeans belong to group O and A, while B group forms only about 10 per cent in them. In pre-Landsteiner days blood transfusions were carried out in England without any blood grouping. Many cases ended fatally and others got black urine but a few were successful. This was due to the fact that there were only two main blood groups in that country, hence in some cases at least there was no incompatibility. In India, however, three blood groups A, O and B are more evenly distributed, hence if transfusions were to be carried out at all without blood grouping the success rate would be far less or nil.

Conclusion

1. Blood group estimation (A, O and B) of 600 persons of Rajasthan has been carried out.

2. Selection of cases was at random but it was so arranged that women should form a large percentage.

3. In women O group is slightly higher than B group but in men B group is higher than O group.

4. Percentage of AB group remains constant in men and women.

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GASTRIC HYDROCHLORIC ACID AND BLOOD CHLORIDE

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It is now generally accepted that the ultimate source of gastric hydrochloric acid is the sodium chloride of blood. It has been demonstrated that if an animal be fed on a completely chloride free diet for some weeks its gastric juice becon s acid free. Also the continued loss of gastric juice from the body of an animal results in a marked fall in the blood chloride (Dragstedt and Ellis, 1930). The so called alkaline tide of the urine after a meal is also attributed to loss of chloride in the hydrochloric acid of gastric juice. This important relation between the blood chloride and the gastric hydrochloric acid, was investigated in the human subjects, under different conditions, and the observations are recorded below.

Clinical Data and Methods

Method of F. T. M. Examination—Gastric content was examined by way of usual fractional test meal method. A Ryle's tube was passed into the 12 hours fasting stomach in the morning, and the whole of the resting gastric content was withdrawn. Then the patient swallowed a tumbler of barley gruel (about 20 oz.), and the gastric content was drawn every fifteen minutes for 2½ hrs. Acid was calculated and expressed in terms of ml. of N/10 NaOH solution required to neutralise 100 ml. of the gastric content. Topfer's reagent was used as indicator for free HCl and phenolphthalein for total acidity. Simultaneously blood chloride and also urinary chloride in 24 hours' collection of urine were estimated in many of these patients.

Gastric Free Hydrochloric Acid Levels—The highest free HCl level, in India, in isochlorhydria has been said to be about 65 ml. and figures above that level have been taken to indicate hyperchlorhydria, with the oatmeal gruel as the test meal (Napier and Das Gupta, 1935; Napier, Choudhuri and Raichoudhuri, 1938).

But in this paper the highest free acid level of isochlorhydria has been taken as 50 ml., with barley gruel as the test meal, because most of the persons with the gastric acid level above 50 ml. in this series suffered from hunger pain and other signs and symptoms of hyperacidity. Highest free acid level above 50 ml. has been taken to indicate hyperchlorhydria and that below 20 ml. as hypochlorhydria or subacidity.

Achlorhydria or anacidity has been taken to mean the absence of free acid in all the samples of F. T. M. examination including the resting juice.

Gastric Free Hydrochloric Acid in Cholera and Choleraic Diarrhœa—Cholera and choleraic diarrhœa are accompanied by sudden and profuse loss of water and sodium chloride from the body. In severe attacks the loss of chloride (as NaCl) is considerable (Rogers, 1913; Liu *et al*, 1933; Banerjee, 1941; Saha and Das, 1951). In many patients the low blood chloride level persists for a fairly long time even when those persons have become symptom-free and are convalescing (Lahiri, 1951). The effect of depletion of the blood chloride on the secretion of gastric hydrochloric acid was studied in 15 convalescent cholera patients. Obviously, in the acute stage of the disease the reaction of the gastric fluid is alkaline owing to the profuse gush of the alkaline serous fluid into the gastro-intestinal tract. So, the investigation was taken up only after the active manifestations of the disease had completely disappeared and the urinary secretion had reappeared in these patients.

Result—There were achlorhydria in 8 patients (53.3 per cent) sub-acidity in 5 patients (33.3 per cent), and normal free hydrochloric acid in 2 patients (13.4 per cent).

Plasma chloride was estimated in all the cases with the following results: In patients with absent or low gastric hydrochloric acid level, it varied between 330 mgm. and 540 mgm./100 ml. plasma, the normal being 570—620 mgm./100 ml. plasma. In two patients with normal, free hydrochloric acid level, blood chlorides were 568 and 611.6 mgm. per 100 ml. plasma, i.e., normal.

Excretion of chloride in the urine roughly maintained an inverse relation to its secretion as gastric HCl especially noticeable in cases with relatively improved plasma chlorides along with deficient gastric HCl.

Effects of histamine were studied in 9 patients by injecting intramuscularly 0·25 mgm. of histamine acid phosphate immediately after completing the withdrawal of the 9th sample of F. T. M., and then drawing out the post-histamine sample of gastric content 30 minutes after the injection. The results were that histamine failed to stimulate any hydrochloric acid secretion in patients who had achlorhydria, but in others with subacidity there was increased HCl secretion, but the range of increase was not very marked. It was also found that those patients who initially had very high specific gravity of blood (1066-1072), indicating great loss of body fluid and salts, more commonly showed achlorhydria or marked hypochlorhydria than those who had comparatively lower specific gravity of blood even when the latter was associated with collapse and anuria. It may be mentioned here that two of the above patients (Cases 9 and 13 in Table 1) with achlorhydria showed hyperchlorhydria on later FTM examinations indicating that their acid secretions were not habitually deficient. This increased acid secretion in both the patients was accompanied by restoration of normal plasma chloride levels. Thus achlorhydria and hypochlorhydria in cholera were found associated with lowered plasma chloride, and those patients who showed normal gastric acid secretion had normal blood chloride level (Table 1).

Effects of Low Salt Diet on Gastric Hydrochloric Acid—This was studied in 14 persons, 8 of them being hyperchlorhydric, 5 being isochlorhydric, and 1 hypochlorhydric. 8 persons were males and 6 were females. The low salt diet was provided by milk and rice only, without any additional salt added to diet. In peptic ulcer patients with hyperchlorhydria two hourly milk diet for two weeks or so was followed later by milk and rice diet as above, during the rest of the period of the investigation.

Result—Gastric acid was appreciably diminished in 8 persons (6 females and 2 males), in 7 to 30 days in 5 persons with iso- or hypochlorhydria, and in 12, 36 and 54 days respectively in 3 persons with hyperchlorhydria. In 6 other persons all males suffering from either peptic ulcer or gastritis with hunger pain, there was no appreciable diminution of the acid curve in 10 to 28 days.

There occurred complete achlorhydria in three patients, all debilitated females, in 7, 23 and 30 days, respectively. It may be mentioned here that there was drastic fall in the acid curves in all the females investi-

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TABLE 1—SHOWING GASTRIC HCl AND BLOOD AND URINARY CHLORIDES IN CHOLERA AND CHOLERAIC DIARRHŒA (F. T. M. EXAMINATION WITH BARLEY GRUEL: FREE HCL EXPRESSED AS ML. OF N/10 NaOH SOL. REQUIRED TO NEUTRALISE IT)

Case No.	Age in years, Sex	Sp. gr. blood on admission	Total anuria hours	Exam. hours after 1st urine	FTM Max. free HCl	Free HCl after histamine	Plasma chloride mgm/ 100 ml.	24 hours collection urinary chloride %	gm.
1	28, M	1070	18	24	0	0	520	0.18	2.4
2	25, M	1072	24	96	0	0	540	0.75	8.5
3	43, F	1072	13	19	0	—	480	—	—
4	21, F	1072	17	48	0	—	330	—	—
5	22, M	1072	19	120	0	—	529	0.55	6.4
6	60, M	1064	48	24	24	—	611.6	0.8	9.3
7	44, M	1072	40	72	42	—	568	0.6	6.8
8	23, M	1064	48	120	8	—	513.5	0.8	9.8
9	37, M	1070	36	12	0	0	525	1.4	17.1
10	50, M	1070	50	12	0	0	500	0.6	7
11	24, F	1064	30	12	15.5	30	540	0.16	1.4
12	35, F	1064	30	12	9.5	18	525	0.44	4.1
13	30, M	1070	25	216	0	0	510	0.66	7.3
14	35, M	1070	26	120	4	6	520	0.22	2.5
15	28, M	1068	12	144	8	20	540	0.16	1.8

N.B.—*Max. free HCl=Maximum height of gastric free HCl Curve in F. T. M. examination*

TABLE 2—SHOWING RELATION OF LOW SALT DIET AND GASTRIC HCL AND BLOOD AND URINARY CHLORIDES

Case No.	Age in years, Sex	Hospital Full Diet				Low Salt Diet (Milk, sugar and rice)					Clinical Diagnosis
		Plasma chloride mgm/ 100 ml.	24 hours urine chloride		FTM Max. free HCl	Days	Plasma	24 hours urine chloride		FTM Max. free HCl	
			%	gm.				%	gm.		
1	35, F	—	—	—	66	36	475	0.56	—	14	Hyperchlorhydria
2	35, F	—	—	—	36	16	508	0.04	—	12	Pregnancy with chronic B. coli infection
3	34, M	540	0.53	8.2	82	54	528	0.65	11.8	73.5	Hyperchlorhydria
4	45, F	560	0.2	—	44	7	—	—	—	0	Nutritional œdema
5	32, F	576	0.55	8.3	34	23	510	0.1	—	0	Erosion cervix with anæmia
6	46, M	592	0.56	7.8	52.5	12	540	0.46	—	51.5	Gastritis with hunger pain
7	37, M	600	0.32	4.5	64	12	540	—	—	34	Postcholeraic gastritis with hyperacidity
8	20, F	570	0.2	2.0	18	26	520	0.16	1.9	7.5	Kala-azar
9	15, F	575	0.58	5.0	33	30	350	0.12	0.6	0	Kala-azar
10	45, M	570	0.25	2.4	44	10	—	0.16	1.8	44	Gastritis with hunger pain
11	35, M	540	1.1	14.1	86	16	490	0.1	1.4	88	Cured duodenal ulcer
12	50, M	500	0.35	5.7	112	28	500	0.8	10.5	108	Duodenal ulcer
13	60, M	520	0.7	5.7	80	20	397	0.5	4.9	77	Duodenal ulcer
14	22, M	540	0.3	3.3	66.5	10	480	0.48	—	66	Gastritis with hunger pain

gated in this series. Plasma chloride became subnormal in all the persons in whom the gastric acid level was diminished by low salt diet. The converse was however not always true. It was also noticed that saline purgatives in addition to low salt diet tended to bring down the level of the gastric hydrochloric acid in some resistant persons (Table 2).

RELATION OF GASTRIC HYDROCHLORIC ACID WITH BLOOD AND URINARY CHLORIDES IN HYPERCHLORHYDRIA —The possibility of an inverse relationship existing between the amount of chloride daily excreted in the urine as sodium chloride and also as hydrochloric acid in gastric juice, the common source of both being the sodium chloride of blood, was specially studied in patients with hyperchlorhydria, in which condition there is excessive secretion of hydrochloric acid in the stomach.

Simultaneous estimation of blood chloride, quantity of urinary chloride in total collection of urine of previous 24 hours, and F.T.M. examination, were made in 14 persons wih hyperchlorhydria.

Result—Out of 14 patients examined in this way, in 10 persons (71.4 per cent), the daily excretion of chloride in the urine was less than normal, and in 9 persons (64.3 per cent), the total quantity excreted was below 6 gm. in 24 hours on our hospital full meal diet. Total chloride excreted in the urine in 24 hours,

TABLE 3—SHOWING RELATION OF HYPERCHLORHYDRIA AND BLOOD AND URINARY CHLORIDES ON HOSPITAL FULL DIET

Case No.	Age in years, Sex	FTM max. free HCl	Urinary chloride 24 hrs.		Plasma chloride	Clinical Diagnosis
			%	gm.		
1	34, M	82	0.75	8.2	540	Hyperchlorhydria with hunger pain
2	27, M	52	0.3	4.1	548	Gastritis
3	29, M	64	1.14	16.2	600	Duodenal ulcer, (cured) x-rayed
4	40, M	52	0.3	4.1	520	Duodenal ulcer with melæna, x-rayed
5	37, M	64	0.32	4.5	510	Gastritis, postcholeraic
6	60, F	74	0.095	1.4	552	Gastritis
7	50, M	112	0.35	5.7	500	Duodenal ulcer x-rayed
8	60, F	52	0.09	0.5	570	General anasarca with anæmia
9	60, M	80	0.7	5.7	520	Duodenal ulcer x-rayed
10	35, M	86	1.1	15	540	Duodenal ulcer (cured) x-rayed
11	35, M	90.5	0.8	8.7	545	Postcholeraic gastritis
12	22, M	66.5	0.3	3.3	540	Gastritis with hunger pain
13	52, M	77.5	0.5	3.7	500	Duodenal ulcer x-rayed
14	32, M	72	0.76	6.6	496	Duodenal ulcer x-rayed

TABLE 4—SHOWING RESULTS OF FTM EXAMINATION AND EXAMINATION OF BLOOD CHLORIDE IN SEVERE ANÆMIA ASSOCIATED WITH OTHER DISEASES

Case No.	Age in years, Sex	RBC per c.mm. in millions	Hæmoglobin		W.B.C. per cmm.	FTM Max. Free HCl	Plasma chloride	Clinical Diagnosis
			Sahli	gm./ 100 ml.				
1	26, M	0.59	12	2	750	42	533	Kala-azar with ankylostomiasis
2	40, M	1.52	12	2	5900	50	520	Peptic ulcer with hæmorrhage
3	60, F	2.0	45	7.6	11000	52	600	General anasarca. W.R.7/10
4	42, M	2.0	35	5.9	3500	22	610	Malaria
5	45, F	2.57	50	8.5	4600	44	496	Nutritional œdema
6	28, F	1.45	30	5.1	3200	28	—	Chronic hepatitis
7	40, M	2.55	40	6.8	5600	26	570	Chronic gastritis
8	40, F	0.86	18	3.1	—	50	530	Pregnancy with chronic sepsis
9	38, M	1.36	35	5.9	5950	20	—	Early gastric carcinoma
10	62, M	2.80	45	7.6	44200	25	—	Early cancer stomach with hepatitis
11	50, F	2.25	40	6.8	7650	11	520	Chronic colitis
12	19, F	1.68	30	5.1	3450	3.5	480	Chronic malaria with splenomegaly
13	20, F	1.62	30	5.1	2350	18	540	Kala-azar
14	15, F	2.65	45	7.6	1550	0	350	Kala-azar with saltfree diet
15	30, M	2.45	46	7.8	2450	26.5	570	Ascites, W.R. 3/10
16	46, M	2.72	46	7.6	6550	86	—	Chronic gastritis
17	35, F	2.96	48	8.2	3450	36	—	Pregnancy with chronic B. coli infection
18	40, F	2.69	50	8.5	6900	64	—	Dyspepsia
19	15, M	2.76	50	8.5	6900	28	616	Dyspepsia
20	35, F	2.57	40	6.8	4600	0	410	Chronic colitis with fever for 2 months

as NaCl, with the same diet as above, in 20 healthy adults was—lowest 7.3 gm., highest 19.5 gm. and average 11.5 gm. Plasma chloride was subnormal in 12 of these persons (85.7 per cent), which included all the 9 patients in this series whose peaks of the gastric HCl curves were above 64 ml. (Table 3).

ANÆMIA AND GASTRIC HYDROCHLORIC ACID IN RELATION TO BLOOD CHLORIDE—In the pernicious (Addison's) type of anæmia, achlorhydria is the usual rule (Hurst, 1923), whereas the tropical macrocytic anæmia, does not bear any significant relation to gastric hydrochloric acid secretion. In idiopathic hypochromic anæmia in young adult males Shorthouse and King (1951) observed achlorhydria in 16 out of 20 patients (80 per cent). Apperly and Cary (1936) noticed a relationship between the low acid concentration in the gastric juice and the low erythrocyte count, in dogs and human subjects. They observed that in severe anæmia due to hæmorrhage hydrochloric acid disappeared from the gastric juice. Alvarez and Carlson (1936) found that when the hæmoglobin falls below 75 per cent, free gastric acidity is also reduced. These views are not however universally accepted (Hurst, 1936). In the present series, 20 patients with severe anæmia, associated with some other debilitating disease, and with total erythrocyte counts varying between 2.96 million and 0.59 million, per c.mm. and hæmoglobin

between 50 per cent and 12 per cent (Sahli), were investigated as to their gastric hydrochloric acid secretion.

Result—The results were—achlorhydria in 2 (10 per cent), both females, hypochlorhydria in 3 (15 per cent) all females, isochlorhydria in 12 (60 per cent) and hyperchlorhydria in 3 patients 15 per cent), both males and females. Plasma chloride was estimated in 14 patients, and it was found below normal in 9 persons (64.3 per cent), including all the 5 persons showing deficiency of free gastric HCl secretion. In all of the latter, the concentration of chloride in plasma was much below the normal range and in a few it resembled those usually found in cholera patients. In one of the patients mentioned above with complete achlorhydria on low salt diet, the maximum gastric free acid level rose to 33 ml. after restoring normal full meal diet for three weeks.

Incidentally also it was noticed that neither high leucocytosis nor severe leucopenia had any influence on the gastric acid secretion (Table 4).

Discussions

The ultimate source of gastric hydrochloric acid is known to be the sodium chloride of blood. Hence the great depletion of salt from the body is likely to affect this acid secretion adversely. This was particularly evident in patients convalescing from cholera, a disease associated with hypochloræmia caused by the great loss of sodium chloride from the body. There was complete achlorhydria in 53·3 per cent and subacidity in another 33.3 per cent of the patients, when examined within 12 to 216 hours after the urinary secretion was re-established. Plasma chloride was found below normal in all of these patients. In the remaining 13.4 per cent of the patients who had normal gastric acid secretion also had normal plasma chloride. Histamine injection failed to stimulate any acid secretion in hypochloræmic, achlorhydric persons, and it only feebly stimulated the secretion in persons showing subacidity accompanied by subnormal plasma chloride. It may be mentioned here that the organic tissue changes were not likely to be responsible for the above findings, because of the paucity of the former changes, found post mortem, in contrast to the violent outburst of the symptoms of this disease. Moreover the F.T.M. examinations were made in all these patients after other normal secretory functions of the body, as apparent from outside were re-established. It may be noted here incidentally that many of the biochemical and other changes observed in cholera patients such as hæmoconcentration, hypochloræmia, and also increased potassium, total protein, and non-protein nitrogen of blood, resemble those found in adrenalectomised animals, and persons suffering from Addison's disease, the only difference being acuteness of the symptoms of the former disease even though they are transient in many cases who ultimately recover. Another common feature, as found in the present investigation, is the lowered gactric acid secretion. All these facts point to the possibility of the sudden dysfunction of the suprarenal cortex being a cause of the great loss of chloride from the body in cholera patients. Moreover desoxycorticosterone is said to influence the membrane permeability of the tissues generally, specially capillary permeability (Best and Taylor, 1945), and its dysfunction may have some relation with abnormal fluid loss in this disease.

Deficiency of gastric acid secretion occurred not only where there was great drainage of salt out of the body, as in cholera patients, but also in many cases where the daily intake of salt was deficient for a long time. This was more noticeable in females than in males and in asthenic patients suffering from some debilitating ailments than in vigorous persons. But the cause of this difference is difficult to explain. In persons suffering from hyperchlorhydria, the acid secretion appeared to be resistant to low salt diet in many cases, the intrinsic salt in the food in such cases supplied the chloride required for the acid formation, at the cost of blood chloride, and often also of urinary chloride levels. It was noticed in some patients that once the level of their gastric acid was sufficiently brought down by a low salt diet or otherwise, its subsequent restoration to the former level did not always occur quickly, even on addition of extra salt to the diet.

In persons suffering from hyperchlorhydria, the amount of chloride eliminated in the gastric juice as HCl showed an inverse relation to the amount of the chloride excreted in the urine. In the majority of these persons the amount of plasma and urinary chlorides were found below average normal. This is to be expected because the common source of both the gastric hydrochloric acid and urinary chloride is plasma chloride, and excessive outlet of chloride through gastric juice affects the chloride levels of the other two. Deficiency of hydrochloric acid secretion has also been said to be associated with low count of erythrocytes or low percentage of hæmoglobin in the peripheral blood. The latter points were investigated in the present series by F. T. M. examinations and simultaneous estimation of blood chloride in patients suffering from severe anæmia associated with some other diseases. No direct relationship was found to exist between the low erythrocyte count, or low percentage of hæmoglobin with deficiency of hydrochloric acid secretion. As an illustration, Case 1 in Table 4 with erythrocyte count 0·59 million per c.mm., hæmoglobin 12 per cent (Sahli), and total leucocyte 750 per c.mm., on F. T. M. examination showed the maximum free hydrochloric acid level to be 42 ml. Only 5 persons, all females, out of a total of 20 severely anæmic patients showed deficiency of gastric acid secretion. Plasma chloride in all those 5 patients were below normal. It is more likely that in symptomatic anæmia with deficient hydrochloric acid secretion there may be some other factors including hypochloræmia in many cases responsible for this deficiency than the deficiency of hæmoglobin, and low ery-

throcyte count. In anæmia caused by profuse hæmorrhage, chloride depletion, as in cholera patients, may be the causative factor instead of deficiency of erythrocyte count or lowered hæmoglobin percentage. It may be mentioned here that in some of the abovenoted anæmic patients, though their gastric HCl secretion showed normal figures, yet their blood chlorides were below normal. This would indicate that their intake, or absorption of sodium chloride, besides other pathological factors, might be below their requirements and this might lead to subacidity later on. Excessive sweating is a common feature in the tropics, especially during the summer with profuse loss of chloride and water from the body. Its influence on the gastric acid secretion and also its relation with various conditions common during the summer months, associated with deficient gastric acid secretion may form an interesting point for further study.

All the findings discussed above corroborate the clinical importance of the physiological observations regarding the close relationship existing between the blood chloride and the gastric hydrochloric acid secretion. They also show the importance of supplying adequate quantity of salt to the daily diet, especially in debilitated persons to maintain the gastric acid level. This is all the more important in the tropics where there occurs an additional loss of chloride from the body with sweat during the summer.

Summary

In many persons with low blood chloride level, produced either by its excessive drainage, as in cholera, or by insufficient intake, as in persons having low salt diet, especially in females and debilitated persons, deficiency of the gastric acid secretion occurred. In the majority of the persons suffering from severe anæmia, associated with some other debilitating diseases the gastric acid level was found to be within the normal limits, but in those anæmic persons in whom the acid secretion was diminished, it was found to be associated with low blood chloride level though the converse was not always true. Majority of the persons with hyperchlorhydria had subnormal blood and urinary chlorides, owing to the excessive drainage of the latter through the gastric juice.

Acknowledgment

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ETHER CONVULSIONS*

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Ether convulsions, better named as convulsions during ether anæsthesia denotes a state of involuntary contraction of the voluntary muscles of the body, especially those seizures in which the body is thrown into violent spasmodic contractions during ether anæsthesia.

The convulsions generally commence with twitchings of the muscles of the eyelids and face, gradually the muscles of the upper and lower extremities and trunk are involved, and finally generalised convulsions develop. In exceptional cases the twitching of the muscles of the eyelids and face appears later than that of the extremities.

One might be inclined to take it as idiopathic convulsion during ether anæsthesia without any particular cause as the single common ætiological factor is not clearly understood in the cases.

Factors responsible for the convulsions during ether anæsthesia are:

(1) *Age*—Children and young adults are prone to such convulsive attacks although older subjects are not immune to such attacks. Ether convulsions are reported in cases up to fifty years of age.

(2) *Sex*—This factor is not well established.

(3) *Individual susceptibility*—According to Alfred Lee (1947) people who are prone to have convulsions as shown by electroencephalography are likely to develop ether convulsions.

(4) *Biochemical factor*—According to Kemp (1944), anoxia of the cerebral cells owing to interference with or inhibition of cerebral cell respiration due to alkalæmia is the primary factor of convulsions during anæsthesia.

* Read at the 3rd annual conference of the Indian Society of Anæsthetists, December 1951, Calcutta, when the author was attached to the Medical College Hospital, Calcutta.

Hyperventilation of the lungs due to over-breathing and diminished renal excretion produce alkalæmia which inhibits dissociation of oxygen from oxyhæmoglobin and interferes with the oxygenation of brain cells specially those of the cerebral cortex. Factors producing hyperventilation of the lungs are—Insufflation endotracheal anæsthesia, over-atropinisation, fear, hyperthermia due to sepsis, toxæmia, hot humid atmosphere and surgical stimulus like traction on the peritoneum, etc. Depression of renal secretory activity due to deep anæsthesia helps in producing alkalæmia by preventing elimination of (alkali) phosphates and bicarbonates. The convulsions are of a protective nature and help to restore the acid-base balance.

It should be mentioned, however, that sometimes over-dosage of CO_2 also produces spasmodic contraction of the muscles of the body resulting in convulsions.

(5) *Increased cerebral venous congestion*—This may in some cases give rise to convulsions. Increased cerebral venous congestion takes place, when the head end of the patient is low in Trendelenberg's position, the high gall bladder or kidney bridge is used with resultant position of a low head and over-extension of the neck. The tight fit of the harness of the gas machine also obstructs the venous return from the brain.

(6) *Ether*—(*a*) Over-dosage: This causes stagnant and anoxic anoxia by depressing the vital medullary centres. Moreover histotoxic anoxia also prevails when the anæsthetic acts as poison due to overdosage on the various tissue cells especially that of the brain by inhibiting the oxidation-reduction enzymes of the tissues.

(*b*) Impurities in ether: Impurities in the ether, like traces of peroxides and aldehydes have been known to cause convulsions.

(*c*) Overheated ether: This may give rise to convulsions.

(7) *Climate* (warm humid operation theatre atmosphere)—The cases generally happen round about the month of June when the weather is hot and damp. The rubber sheet drapings interfere with heat loss and sweating consequently facilitating convulsions.

(8) *Neurotoxin*—A neurotoxin produced by a specific strepococcus present in the nasopharynx has been found to be responsible in some cases.

(9) *Acute toxæmia and septicæmia*—In acute toxæmia and septicæmia the prevailing histotoxic anoxia might be an additional factor for such convulsions.

(10) *Disturbance of calcium metabolism*—Some cases of ether convulsions have been relieved by intravenous injection of calcium gluconate proving that the calcium deficiency is one of the factors for such.

According to Lundy (1945) other factors may be enumerated as follows:

Hypoglycæmia and ketosis, cerebral œdema, idiosyncrasy and instability of the nervous system, the use of oxygen, over-oxygenation and impurities in oxygen, anaphylactic œdema, hydration of protein particles in the plasma and convulsant poisons, trauma, method of anæsthesia and lightness of anæsthesia.

TREATMENT: Principal treatment is prophylactic.

(1) Stop administration of ether and wash away any trace of ether in the anæsthetic circuit. Remove mask and harness, if any.

(2) See that the airway is perfect and administer oxygen through an intratracheal tube whenever possible to relieve any latent anoxia. Artificial respiration through the intratracheal tube whenever necessary.

(3) Inhalation of 5 per cent CO_2 (carbon dioxide) and 95 per cent of oxygen by face mask and rebreathing bag is beneficial in many cases.

(4) Elevation of the head of the patient, removal of harness and compression of carotids will relieve cerebral congestion to some extent.

(5) Anti-convulsant drugs—intravenous injection of short acting barbiturates, e.g., pentothal sodium (5 per cent to 2½ per cent) 2 to 4 c.c. very slowly and carefully and repeat 2 to 4 c.c. if necessary slowly and carefully just sufficient to control convulsions without depressing the respiratory and cardiac centres.

Curare, myanesin, flaxydil and such muscle relaxant drugs are useful.

(6) In cases with high temperatures application of cold on face, limbs and chest and the use of fan is of some value.

(7) Calcium given by the intravenous route 10 per cent 10 c.c. is beneficial in some cases.

(8) Coramine helps in cases of gross overdosage of ether. When the general condition of the patient turns very bad due to convulsion, coramine should also be given. Adrenaline is also recommended on such occasions.

(9) According to Kemp (*loc. cit.*) intravenous saline with 10 per cent glucose and also 2 drams of ammonium chloride in 2 ounces of water should be given *via* a stomach tube which will stimulate renal activity and help in alkali elimination.

(10) Patients' blood pH and and urine pH must be done within an hour after the convulsion.

MORTALITY: Mortality rate is approximately 23 per cent according to the Guy's Hospital report upto the year 1936.

At present the major percentage of mortality rates due to anoxia has diminished with the frequent administration of intratracheal anæsthesia.

Below are given three illustrative cases of ether convulsions occurring in the month of June 1951 in the Medical College Hospitals, Calcutta.

CASE REPORTS

Case 1—A Hindu, female, aged 30 years, admitted into the hospital for cholelethiasis. General condition—fair. Hb.—75 per cent (Sahli); B.P.—106/76; P/R—88/20; Urine—sugar and albumen—nil.

The patient was put up for operation of cholecystectomy on 8th June, 1951.

Premedication—Morphine Sulphate grain 1/6, atropine sulphate grain 1/100 given 1 hour before the operation.

Anæsthesia—semiclosed method (intratracheal—nasal route). At 9-15 a.m. the patient was induced by ethyl chloride followed by ether (open). Intratracheal tube No. 6 was put in *via* nasal route and fitted with Boyles machine and only oxygen was bubbled through ether. At 10-15 a.m. myanesin 10 per cent 8 c.c. I.V. given. After the dense adhesions between the liver, gall bladder and duodenum separated and cystic duct clamped at about 10-50 a.m., convulsions started beginning at the lower extremities and trunk spreading to the upper extremities and the face. The patient was in the 3rd plane of surgical anæsthesia.

Immediately the ether was switched off, the harness removed, ether from the anæsthetic circuit washed away as far as practicable and only oxygen was administered *via* the intratracheal tube. The head of the patient was elevated and the carotids were temporarily compressed to relieve cerebral congestion.

Next 2·5 per cent of pentothal injected (5 c.c. only) intravenously very slowly and the convulsions stopped.

The surgeon was asked to carry on and the cholecystectomy operation was soon completed. Anæsthesia was continued by N_2O—2½ litres per min. and oxygen 1·5 litres per min. with intermittent doses of pentothal 1 to 2 c.c. each time upto a total dosage of 10 c.c. 2·5 per cent given until the completion of the operation.

A RECORD OF THE PULSE, RESPIRATION, BLOOD PRESSURE AND PLANE OF ANÆSTHESIA DURING THE OPERATION (CASE 1)

Time	*Pulse per minute*	*Respiration per min.*	*Blood pressure in mm. Hg.*	*Plane of Anæsthesia*	*Remarks*
9-15 A.M.	90	20	102/75	Induction stage	Anæsthesia started
9-25 A.M.	—	—	—	2nd plane lower of surgical anæsthesia	Intubation complete
9-30 A.M.	100	25	104/78	2nd plane lower of surgical anæsthesia	Operation started
9-45 A.M.	110	34	106/78	2nd plane lower of surgical anæsthesia	——
10 A.M.	120	25	106/80	3rd plane of surgical anæsthesia	——
10-15 A.M.	108	24	106/80	3rd plane of surgical anæsthesia	Injection myanesin 8 c.c. I. V. given
10-30 A.M.	112	28	106/80	3rd plane of surgical anæsthesia	——
10-45 A.M.	115	23	108/80	3rd plane of surgical anæsthesia	——
10-50 A.M.	—	—	—	—	Convulsion started
11 A.M.	120	30	112/90	2nd plane lower of surgical anæsthesia	I. V. pentothal 2·5 per cent 5 c.c. plus oxygen inhalation
11-15 A.M.	120	28	120/90	2nd plane of surgical anæsthesia	Convulsion stopped N_2O plus oxygen carried on with intermittent dosage of I. V. pentothal
11-30 A.M.	122	27	140/90	2nd plane of surgical anæsthesia	——
11-45 A.M.	124	28	140/92	2nd plane upper of surgical anæsthesia	I. V. Pentothal 10 c.c. 2·5 per cent given till the completion of operation. Oxygen continued.
12 A.M.	140	28	150/100	1st plane lower of surgical anæsthesia	——
12-5 P.M.	138	23	150/98	1st plane of surgical anæsthesia	Operation complete. Oxygen continued

At 12-05 p.m.—By the end of operation—B.P. 150/98, P/R—138/28.

General condition—fair, rectal temperature of the patient was 103°·2. F. Infusion of glucose saline was started before the operation and blood transfusion given during and after the operation (300 c.c.) The blood was pink all through the operation period. In the beginning of the operation the respiration was irregular, overbreathing was noticed and relaxation was not good. After the injection of myanesin the respiration became regular and the relaxation was good.

Post-anæsthetic instructions given—

The patient to lie flat, oxygen inhalation, to continue, keeping off the head on one side, the recording of the pulse, respiration and colour carefully, the use of morphine grain 1/6 when the patient comes round, and the use of penicillin, etc., as usual.

Ether was sent for chemical analysis but the report was not available.

On 9-6-51—The patient developed slight cough with expectorations. Lungs—N.A.D. on examination.

On 10-6-51—Lungs—congestion right base which cleared up gradually. There was irregular temperature for the first nine days. Otherwise there was no other complications.

On 1-7-51—The patient was discharged from the hospital.

Case 2—(This case was reported by Dr. S. Mazumder, Junior Anæsthetist, Medical College Hospital). The patient was a young adult male, aged about 18 years, admitted in the 2nd week of June 1951 as an emergency case of acute abdomen with perforation of gut. General condition—poor. Temperature—99°·4F. P/R 11/20. B/P 104/70.

Premedication given—Atropine sulphate grain 1/100, ½ hour before the operation.

Anæsthesia given—N_2O and O_2 and ether (semiclosed method). When the operation was nearing the end the convulsions started. Ether was stopped and only oxygen continued.

Convulsions stopped after about three minutes and the operation was completed by N_2O and O_2 anæsthesia.

The patient died in a few days time due to post-operative complications which did not relate to anæsthetic convulsions.

Case 3—(This case was reported by Dr. J. Bysack, Senior Anæsthetist, Medical College Hospital). The patient was a female aged about 18 years of average build, anæmia nil, and BP—110/80, heart and lungs—NAD. She was put up for operation for tonsillectomy during the middle of June 1951 in the E.N.T. Department, O.P.D.

Premedication given—atropine sulphate grain 1/100 half an hour before the operation.

Anæsthesia given—Induction by N_2O and O_2 and trilene followed by ether. After intratracheal intubation was done, only oxygen was bubbled through warm ether (by a hot water jacket around the ether bottle).

When the dissection of the 2nd tonsil was commenced suddenly convulsions started.

Immediately the ether was switched off—only N_2O and O_2 continued. As the convulsions did not stop in a few minutes I. V. Pentothal given a few c.c.s→ the convulsion stopped and the operation continued and finished without any further difficulty.

Recovery of the patient was uneventful.

On subsequent chemical analysis—no impurities was detected in the sample of ether.

Prevention

1. History of the patient regarding any abnormality during and after any previous anæsthesia, habits, temperament and psychical characteristics of the patient would be very much helpful to the inquisitive attention of the anæsthetist.

2. Air-conditioned operation theatres in the tropical countries are of primary importance.

3. Complete examination of urine must always be done before the operation and pH of urine should be determined whenever possible if deemed necessary.

4. There should not be the slightest anoxia of any type and liberal quantity of oxygen should always be administered during anæsthesia.

5. Airway must be perfect and intratracheal intubation should be preferred whenever possible in the administration of general inhalational anæsthetics.

6. Respiration should be regular and rhythmical during the plane II and III of surgical anæsthesia stage. Overbreathing and hyperventilation should be prevented during the deep anæsthesia.

7. Patients with high temperatures with acute sepsis, dehydration, general inhalational anæsthesia specially ether should be administered very carefully and the patient should be under constant careful observation.

8. During the hot humid climates the operations should be avoided during the hottest part of the day, i.e., between 10 a.m. and 5 p.m. in the absence of air conditioning. Injection of atropine to dehydrated patients, patients with high metabolic rates due to high temperature should better be given in smaller dosage. One should prefer giving combination of morphine and atropine in the proportion of 1: 25 so that the metabolic stimulant action of atropine is counteracted by morphine.

Barbiturates like luminal, soneryl, etc., are very beneficial in such cases.

9. Heated ether vapour during the warm season should be avoided. Moreover the water jacket round the ether bottle should contain tepid warm water not exceeding 94° F. (34° C.) which is the boiling point of ether.

10. The patient should not be put on a moist mackintosh and covered with similar articles whereby interfering the heat loss and sweating.

11. Trendelenberg's position and other postures in which the head might be kept low should be avoided whenever the anæsthetist smells any possibility of untoward after-effect. Tight harness might be avoided in such cases.

Summary and Conclusion

(1) Age—Of the three cases, two were below 19 years. This is in favour of the condition being commoner in young adults.

(2) Sex—Amongst the three cases, two were females.

(3) Hot humid atmosphere—All the illustrative cases occurred in the month of June when the climate is hot and humid at the maximum—two of them in the midday.

(4) Premedication—Atropine sulphate given only as premedication might have been a predisposing factor in the last two cases. Barbiturates might have averted the complication.

(5) Ether—In the first case the patient was in the 3rd plane of surgical anæsthesia which cannot be accounted to gross over-dosage of ether. In the other two cases also no such thing was noticed.

Regarding impurities, the samples of ether on subsequent analysis were found to be reasonably pure in one case and the report in another case was not available.

Warm ether vapour in Case 3 cannot be accounted alone for the convulsions.

(6) Anoxia—No anoxia was detected in any of the cases illustrated here and the blood was bright pink in all the cases during the whole length of the operation.

(7) Convulsions—In the first case the convulsions started in the lower extremities, then the trunk and lastly the upper extremities and the face were involved whereas in Cases 2 and 3 the convulsions commenced with the muscles of the face and upper extremities and gradually became generalised.

(8) Respiration—Irregularity of the respiration was noticed including over-breathing in Case 1 before the injection of myanesin; the respiration was regular for about half an hour before the commencement of the convulsions.

(9) Posture—In order to facilitate the exposure of the gall bladder, the head end of the patient was low

in Case 1. In Case 3 overextension of the neck was required for the exposure of the tonsils. Both the positions have the tendency to cause cerebral congestion.

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PRACTITIONERS' CORNER

NEW APPROACH TO TREATMENT AND PROPHYLAXIS OF COLDS

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There seems to be consensus of opinions among physicians and public health authorities that the common cold is not a trivial ailment, but represents a menace, especially if looked upon from the point of view of loss of man-hours and productivity of a country. A few illustrative figures will suffice. According to Stocks (1949) 1 in 8 of the total population over 16 years of age contracted a cold during each month of supervision, giving an average of 1·4 colds per person each year. It was estimated by him that 10 per cent of total incapacity in each month was due to colds and febrile catarrh. Another estimate from America is also worth quoting. In spite of its advanced methods of heating, infections of the respiratory tract have caused more loss of time from industry than did all the other diseases combined (Reimann, 1946).

Unfortunately the hopes raised by the intensive research work which, under the supervision of the Medical Research Council, has been going on for years, regarding a virus as the causative organism responsible for the common cold has so far proved, at least therapeutically and prophylactically, a great disappointment. Reading the symposium recently published in the British Journal of Physical Medicine on the subject, one is left with the impression of great disappointment, and, if one so inclined, with an optimistic hope that the future research on the old lines may be more fruitful. Andrewes (1950) emphasized recently that it is still unknown whether the common cold is a single entity or a group of diseases; whether it is caught from another person, or it is activated within the carrier; why it is seasonal, and why the resistance varies from person to person and in the same person from time to time.

Since microbiology has so far failed to elucidate the ætiology of the common cold it remains for the physician to make his careful observations on this minor illness the basis of a *new* approach. Fortunately the writer has for a few decades been a frequent victim to colds, so that he was able to study the malady on himself ("I have been my best 'guineapig' ").

For about 25 years I have been subject to frequent colds, especially in spring and autumn, but also often in winter or any other time of the year. The illness started either in one side of the nose, or in the throat where a burning slightly painful sensation in the pharynx or one tonsil was the initial symptom. The disease usually spread to the respiratory tract, and very distinctly in stages. After a day or two the catarrh spread first to the upper part of the trachea (or larynx), later on extending by degrees to the bronchial tree, leading to a purulent catarrh and mostly to chronic bronchitis, which lasted for several months. The ordinary remedies, especially codeine, although relieving the very obstinate cough did in no way help in avoiding the spreading of the catarrh. An autogenous vaccine, prepared by the Lister Institute, proved rather disappointing therapeutically. Apart from acute colds and respiratory infection—2 to 3 times a year—I suffered from a less pronounced catarrh during most part of the year.

ELICITING FACTORS

Careful observations made on myself for many years have shown that the following factors definitely play a determining rôle in initiating the symptoms:

1. Sudden changes of temperature, e.g., sudden cold spells, very often going into a cold room elicited cough and mucous secretion from nose and/or trachea.
2. Fog, even of a moderate intensity.
3. Moisture of the air, especially rain.
4. Fumes, dusty atmosphere.
5. Sometimes in summer a sudden rise of temperature elicited the catarrh.
6. Sudden lowering of the barometric pressure very regularly elicited the complaints. Often the hypersecretion from the mucous membranes started several hours before the change of weather became apparent: "human barometer".

ÆTIOLOGY

In the light of present rather deficient knowledge, it would appear that the following "causes" may be responsible for acute colds and respiratory catarrh.

1. A viral agent, especially in epidemics and panepidemics.
2. Bacterial agents (pneumococcus, hæmolytic streptococcus, Friedlander bacillus, etc.).
3. As a secondary concomittant infection in some infectious diseases, e.g., small pox.
4. Allergic conditions: rhinitis vasomotoria.

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5. Changes of atmospheric temperature and barometric pressure taking place rapidly, especially in cold-sensitive individuals.

Common Denominator and Pathogenetic Mechanism

The question may be asked what are the pathophysiological changes occurring in the common cold in the diseased tissue, i.e., the mucous membranes mainly, and independent of the causative agent; secondly, is there a common pathogenetic mechanism. The clinical observations show that the malady begins with a vasodilatation and hyperæmia of the mucous membranes of the nose, throat, larynx or trachea. The morbid vasodilatation and swelling leads first to hypersecretion of watery-mucous fluid, which after some time becomes mucopurulent. According to my observations the common cold sometimes begins with a slight or very moderate bleeding from the nose.

Histamine as Hypothetical Common Pathogenetic Mechanism—In recent years the significant role of the metabolite "histamine" in physiology and pathophysiology has become more and more apparent. It has been demonstrated that histamine is a significant regulator of the blood flow in the animal tissue, under conditions of rest and functional activity (Feldberg and Schilf, 1930; Gaddum, 1936). More important for the subject in question is its pathophysiological action on the skin when subject to mechanical, chemical, thermal or electrical irritation. Sir Thomas Lewis (1927) has shown that stimulation of the skin by many and various irritants—prick, scratch, freezin, burn, chemicals, electric current, etc.—gives rise to the "triple response", due to the formation of the H-substance which is identical with histamine. The latter is also the causative agent in allergic conditions as well in so called physical allergies in certain individuals due to sensitivity to cold (Goodman and Gillman, 1941). In this connection it is especially noteworthy that temporary lack of oxygen —hypoxia—leads to considerable dilatation of the capillaries, so that fluid filtered through four times the normal rate, and damage of the capillary wall which becomes permeable to the passage of protein (Landis, 1927). Temporary ischaemia, e.g., by vasoconstriction or local hypoxia damages the capillaries by reason of formation of histamine (Barsoum and Gaddum, 1935).

Considering these facts and the close relationship between the mucous membranes of the respiratory tract and the epidermis, the hypothesis appeared reasonable that in acute colds the initial or primary pathological phenomenon is vasodilatation (after temporary constriction), and capillary damage of the mucous membrane due to the formation of the histamine. According to this conception an infection, be it by pathogenic bacteria or a virus, is only possible or likely to occur *after* a local formation of histamine has led to a pathologically increased permeability of the capillaries with consecutive exudation of protein-rich fluid (serum): only the latter could serve the living agent as a suitable medium for growth and rapid multiplication. If we remember the fact that pathogenetic bacteria like hæmolytic streptococci require for growth a very rich medium (blood serum, etc.), and viruses even embryonic tissue, the advanced conception of a primary vasodilatation and exudation of a serum-rich fluid as a precondition of infection would appear very reasonable indeed.

Adrenaline as Physiological Antihistamine

It is interesting to note that some years ago an American author, "believing that many so-called common colds have an allergic origin or at least an allergic factor", recommended a synthetic antihistamine, benadryl, for its treatment in a rather optimistic report from U. S. Navy (Brewster, 1947). Unfortunately the latest report (Editorial, *New England M. J.*, **244**: 152, 1951) states categorically that antihistamines like benadryl and neotetramine are of no value in the treatment or prophylaxis of the common cold, apart from their frequent side-effects. However, it seems to be little known that adrenaline is the *physiological* antagonist of this very widely spread metabolite. It was shown a long time ago (Schenk, 1921) that adrenaline neutralizes histamine in experiments on human subjects: 1·5 mgm. adrenaline is capable of neutralizing 15 mgm. of histamine, when injected at the same time. All the effects of histamine, with the exception of hypoglycæmia, are suppressed. A quotation from a textbook of pharmacology is worth mentioning here: "Epinephrine in suitable doses can completely antagonize the vasodepressor action of histamine, and many of its other actions as well" (Goodman, 1941).

Clinical Trials with Methedrine

Since adrenaline is rather unstable and is ineffective when taken orally, a close relative synthetic compound especially with pronounced peripheral vasoconstrictor properties seemed to suggest itself. My trials resulted in the choice of *d. deoxyephedrine* for the treatment of the common cold.

Pharmacology—d. Deoxyephedrine (methyl-amphetamine, methedrine) is closely allied to adrenaline, ephedrine and amphetamine. It is much less toxic than the latter compound; its pressor effect is only 1/116 of adrenaline, its central stimulating activity 1/6 of amphetamine (Bovet and Bovet-Nitti, 1948; Levine *et al*, 1948) reported that 20 mgm. of methedrine given intravenously has a more potent central (cephalotropic), and a less potent peripheral vascular effect. In my experience, extending over many years, deoxyephedrine in small doses of 2·5-5 mgm. taken orally, has a pronounced peripheral vasoconstrictor effect, with slight to moderate stimulating central action.

In recent years d. deoxyephedrine has been recommended mainly for its stimulating effects on the central nervous system, viz., in barbiturate poisoning (Poe and Karp, 1949; Zur Verth, 1951); for psychotic and neurotic conditions (Eaton, 1943; Delay, 1949; Meyrson, 1947; Rudolf, 1949; Hope and colleagues, 1951, and for

raising a lowered blood pressure in operations (Dripps *et al*, 1946; Zeller, 1951). Mostly large doses up to 20-30 mgm. by injection, were used.

The first observations on the efficacy of methedrine against common cold and respiratory catarrh I made on myself. At the beginning of a cold—soreness in the throat, bleeding and very frequent watery secretions, usually from one nostril, 2·5-5 mgm. were sufficient to make all the symptoms disappear *fully* within ½-1 hour; after 4-5 hours the dose was repeated. When the infection had already spread to larynx and trachea larger doses of 5-7·5 mgm. were necessary to suppress the complaints, including cough so that I could indulge in my customary cigarette smoking undisturbedly. After the cold was completely controlled, the treatment was continued for a few days with diminishing doses. In order to prevent a recurrence or slight recurrence of the symptoms I took ½-¼ of the original doses. In this way I have managed the last 3½ years to get through the critical periods of the year (spring, autumn, winter) without being subject to acute respiratory catarrhs and prolonged bronchitis.

After I was satisfied that methedrine is the most effective drug against colds, I gave it to several dozen of patients who were treated by me for rheumatism and allied conditions, and who happened to suffer from a common cold. All the patients were treated ambulatorily without interruption of their respective occupations. No other remedy but methedrine was used. In the vast majority of the cases the results were most satisfactory, consisting in rapid disappearance of "stuffy noso", hypersecretion from upper respiratory tract and cough. But great relief was reported practically in every case treated. It is noteworhy that the malaise, tiredness and listlessness usually associated with an acute cold also disappeared rapidly, so that the subjects reported to be fully active and well. Some of the patients used methedrine tablets (5 mgm.) on several occasions and reported most favourably on its effects in aborting a common cold. In most cases 10 mgm. one tablet before breakfast and before lunch—were sufficient to suppress all the complaints. In a few cases higher doses up to 4 tablets (in one case even 6 tablets) were necessary to obtain full relief. In a case of asthma the attack disappeared after 20 mgm. had been taken. In doses of 10 mgm. daily methedrine can be safely used in old people and even in hypertension. I was greatly surprised that it proved rather effective in a case of chronic bronchitis.

Case—Doctor, 73 years, has been suffering for 15 years from angina of effort, which was much aggravated by chronic bronchitis with much wheezing and large quantities of mucopurulent sputum, about 2 ozs. in 24 hours. The cardiac pain on walking was fully relieved after appropriate novocain-injections into the myalgic spots located in the major pectoral near the sternum, in the intercostal spaces. On my advice he took daily 2 tablets of methedrine and reported most favourably on the disappearance of wheezing and cough and rapid diminution of sputum. He was able to walk greater distances without nitroglycerin and without pain.

Posology—The dosage necessary to suppress an acute cold fully seems to vary in different individuals. One has to keep in mind that methedrine does not attack the cause of the disease, but is intended to remove the effects of the malady, i.e., vasodilatation, inflammation and hypersecretion of the mucous membranes. According to the new conception the latter are brought about by the formation of histamine, which has to be neutralised. Obviously the quantity of vasoconstrictor drug required will depend on the severity of the case, and the extent of the inflammatory process. In this connection the following observation made on myself is noteworthy. About 6-8 hours after sunburning of my face, and simultaneously with the appearance of the erythema I developed "catarrh" with cough and mucous sputum: the suppression of these signs required higher doses than usual. I am inclined to explain it by the slow release of histamine from the erythematous skin. In the initial stages of the common cold I gave 5 mgm. 1 tablet—before breakfast and one before lunch. As a routine it should not be taken later than 6 p.m. Under special circumstances when it has to be given late in the evening, it should be combined with ½-1 grain of phenobarbitone, because of the action of the former on sleep (*vide infra*). If the dosage is adequate cough and secretions fully disappear within ½ hour, and this effect lasts for about 5 hours. But in some patients higher doses may be required, especially when the catarrh has already extended to the trachea. A reliable criterion that the dosage is sufficient is, in addition to the disappearane of cough and sputum, or secretion, a slight dryness of the mouth. The latter is of short duration and disappears quickly after a drink or a sweet. It might be advisable to instruct the patient to take as initial dose 1 tablet, and hourly a half till all the symptoms have disappeared; when the effects wear off usually after 5-6 hours, the same quantity should be taken again.

Prophylaxis

Individuals who are known to be liable to frequent colds should be advised to take during the critical periods of the year ½ tablet each morning. This dose is quite harmless, and may be safely given to all people, and in hypertension.

Side-Effects

The relatively small doses required for the effective treatment of colds only—1/5-1/10 of the customary dose of ephedrine (½-¼ gr.)—generally speaking give rise to few side-effects. The most unfavourable side-effect is that it interferes somehow with or shortens sleep, if taken late in the evening. In observation on myself I found that I did not feel inclined to go to bed at the usual time, but 1-2 hours later, and slept with interruptions only 4-5 hours. It is noteworthy that in spite of shorter sleep I felt next morning not tired, but on the contrary very fit and more active than normal. Another side-effect is: it diminishes appetite slightly, so that one feels satiated with less food than

one usually is accustomed to take. For this reason it may be recommended in obesity: by interfering only slightly with appetite it makes a slow reduction in weight possible, in a not unpleasant way. An interesting and favourable side-effect is that even 2·5 mgm. of methedrine has a distinct stimulating effect on the brain. It diminishes fatigue and listlessness, when present, e.g., on a muggy rainy day, makes one more active and enterprising. Cerebration is remarkably hastened, inhibitions greatly diminished, so that talking becomes more easy and rapid, and even a condition of volubility may be noticeable.

SUMMARY

A new conception was considered, viz., that in the common cold, of whatever cause, the primary pathogenetic mechanism is the formation of histamine. Since adrenaline is a *physiological* antihistaminic, a synthetic allied sympathomimetic compound, d. deoxyephedrine (methedrine), was used for the effective control of the malady. Clinical trials extending over several years seems to justify the conclusion that methedrine in suitable doses is capable of abolishing all the symptoms of acute cold and respiratory catarrh effectively and rapidly. If continued for a number of days, methedrine appears to cure acute colds, without recurrence after discontinuing the drug. It gave also satisfactory therapeutic results in subacute and chronic bronchitis.

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SPECIAL ARTICLE

STATISTICAL SICKNESS SURVEY OF THE INSURED EMPLOYEES IN KANPUR

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The Employees State Insurance Scheme, first of its kind in South-East Asia was introduced in our country on 24th February, 1952. This social security scheme is functioning at present in Kanpur and Delhi. Its basic aim to treat the sick and the injured employees and provide them with cash benefits in the event of sickness, maternity and injury, against compulsory cash contribution. It further provides the dependents of the employee if the latter dies on account of an employment injury.

The medical benefit is the backbone of this scheme and, has been well organised. It consists of free medical treatment which is administered to them at 13 State dispensaries situated near the residential concentration of the employees. Each wholetime medical officer who is at least a medical graduate, is allotted up to 2,500 employees to look after their treatment. The sick persons who are unable to attend the dispensary are visited at their residences or, are admitted to the local hospitals.

The poor employees who live in the most dirty areas, notoricusly named as 'ahatas' of the city and, work in the factories while exposed to injuries and occupational diseases, are liable to bear the brunt of the disease more as compared with the other population. Since this utility scheme has now been adopted, it is imperative to do a planned study of the occurrence of the disease and, devise means to secure better health for the industrial employee. The statistics form the vital part for such a study and these are to be compared from one period to another, to find out the positive approach to the problem. In this article, an attempt has been made in this direction. The various figures including the rate of sickness and the man-days lost due to individual disease have been collected from Rambagh dispensary for a period of six months from March up to August 1952. The sickness figures have been arranged according to the special list of 50 causes (Table 1).

TABLE 1—STATEMENT OF 7,095 NEW AND 2,534 CERTIFIED SICK PATIENTS; 15,790 TOTAL AND AVERAGE MAN-DAYS LOST PER INDIVIDUAL DISEASE FROM MARCH TO AUGUST, 1952, OF RAMBAGH DISPENSARY, KANPUR

Cause Group number	*Name of Disease*	*Sickness %*	*Certified sickness % of the total*	*Total man-days lost*	*Average man-days lost per patient*	*Remarks*
1	Tuberculosis of respiratory system	0.39	92.7	1680	67	Two did not turn up
2	Tuberculosis of other forms ...	0.17	20.0	142	71	Certified patients—abdominal tuberculosis
3	Syphilis and its sequelæ ...	0.28	22.2	16	4	
4	Gonococcal infection	0.28	5.5	3	3	
5	Dysentery—all forms	4.88	47.6	806	5	Mostly amœbic
6	Other infective diseases arising in the intestinal tract:					
	(*a*) Cholera	0.04	00.0	—	—	Died
	(*b*) Other infective diseases ...	0.24	60.0	236	26	All certified (9) Typhoid
7	Certain diseases common among children:					
	(*a*) Scarlet fever	0.00	00.0	—	—	
	(*b*) Diphtheria	0.00	00.0	—	—	
	(*c*) Whooping cough	0.00	00.0	—	—	
	(*d*) Measles	0.00	00.0	—	—	
	(*e*) Mumps	0.07	100.0	35	9	
	(*f*) Chicken pox	0.09	100.0	125	21	
8	Typhus and rickettsial disease ...	0.00	00.0	—	—	
9	Malaria	6.50	48.4	1125	5	
10	Diseases due to helminths: ...					
	(*a*) Filariasis	0.07	25.0	10	10	
	(*b*) Other helminths	0.17	00.0	—	—	
11	Infective and parasitic diseases:					
	(*a*) Cerebrospinal fever	0.00	00.0	—	—	
	(*b*) Plague	0.00	00.0	—	—	
	(*c*) Small pox	0.04	100.0	35	18	
	(*d*) Leprosy	0.12	00.0	—	—	
	(*e*) Kalazar	0.00	00.0	—	—	
	(*f*) Parasitic skin infections ...	0.00	00.0	—	—	Included in No. 45
	(*g*) Other diseases	6.58	36.1	990	6	Fevers unspecified
12	Malignant neoplasm	0.01	100.0	27	27	Teratoma—died
13	Benign neoplasm	0.00	00.0	—	—	
14	Allergic disorders	0.88	40.0	312	12	Mostly allergic asthma cases
15	Diseases of thyroid gland ...	0.04	50.0	8	8	
16	Diabetes mellitus	0.04	00.0	—	—	
17	Avitaminosis and deficiency states	0.01	100.0	30	30	
18	Anæmias	1.17	4.8	92	23	
19	Psychoneurosis and psychoses ...	0.01	100.0	2	2	
20	Vascular lesions affecting C. N. S.	0.00	00.0	—	—	
21	Diseases of the eye:					
	(*a*) Trachoma	1.09	22.4	99	6	
	(*b*) Other diseases	4.10	26.9	352	4	Mostly conjunctivitis
22	Diseases of the ear and mastoid process	2.71	7.0	54	4	Mostly otitis media
23	Rheumatic fever	0.00	00.0	—	—	
24	Chronic rheumatic heart disease ...	0.00	00.0	—	—	
25	Arteriosclerotic and degenerative heart diseases	0.00	00.0	—	—	
26	Hypertensive disease	0.01	100.0	9	9	
27	Diseases of veins	0.37	00.0	—	—	
28	Acute nasopharyngitis (common cold)	12.95	36.9	1925	5	
29	Acute pharyngitis and tonsilitis, hypertrophy of tonsils and adenoids ...	1.65	14.6	77	4	
30	Influenza	0.48	90.3	61	2	
31	Pneumonia	0.58	100.0	216	6	
32	Bronchitis	6.78	33.4	1215	8	
33	Silicosis and occupational fibrosis ...	0.04	100.0	17	9	
34	All other respiratory diseases ...	0.09	100.0	74	12	
35	Diseases of stomach and duodenum except cancer	8.97	35.6	893	4	Dyspepsia
36	Appendicitis	0.07	100.0	82	20	Two died
37	Hernia of abdominal cavity ...	0.05	00.0	—	—	
38	Diarrhœa and enteritis	6.04	45.90	669	3	
39	Diseases of gall bladder and bile ducts	0.05	100.0	71	24	
40	Other diseases of digestive system:					
	(*a*) Diseases of teeth	3.10	18.0	157	4	
	(*b*) Other disorders	1.57	12.3	59	4	Diseases of oral cavity

TABLE I (CONTD.)

Cause Group number	Name of Disease	Sick. ness %	Certified sickness % of the total	Total man-days lost	Average man-days lost per patient	Remarks
41	Nephritis and nephrosis ...	0.00	00.0	—	—	
42	Diseases of genital organs:					
	(a) Male	0.33	96.0	181	8	
	(b) Female	0.00	00.0	—	—	
43	Deliveries, pregnancy, complications, childbirth and puerperium ...	0.00	00.0	—	—	
44	Boils, abscesses, cellulitis and other skin infections	6.89	47.0	1440	6	
45	Other diseases of skin	4.78	4.3	60	4	Mostly eczema
46	Arthritis and rheumatism except rheumatic fever	7.40	33.0	887	5	
47	Diseases of bones and other organs of movement	0.05	100.0	13	4	
48	Congenital malformations and diseases peculiar to early infancy ...	0.00	00.0	—	—	
49	Other specified and ill defined diseases	2.10	32.1	290	6	
50	(a) Accidents and violence ...	5.53	45.9	1271	7	
	(b) Poisoning	0.04	100.0	8	4	Lead absorption in paint industry

DISCUSSION

General—Rambagh dispensary is situated in the new area of the city hence the living quarters are somewhat open and healthier. The total number of insured persons registered in this dispensary is 8,616. During this period of six months 26·7 per cent of this number have been treated out of 35·7 per cent came for leave and treatment both. Average daily attendance of the new patients is 39 and that of the old patients is 90. The daily average of sick persons on leave is 87 thus the sickness hampers the production by 1·01 per cent daily. In spite of the opposition to this scheme from some quarters and initial difficulties, 64·3 per cent of patients came only for the treatment. This is highly encouraging and it suggests how well the insured persons are utilising this scheme.

Medicines—The insured sick persons are administered all kinds of medicines including modern chemotherapeutic drugs, antibiotics and various injectables. The standard of treatment is of a very high order. The tubercular patients, in addition to the usual treatment get dihydrostreptomycin and para-aminosalicylic acid liberally. This is a great achievement and it is a boon to the poor insured patient. The x-ray and all other pathological examinations are done free for them. Within a short time a central x-ray clinic and a laboratory will be opened only for the insured persons. Thus the insured employees have been provided with the most modern and specialised treatment.

Rate of Sickness—The respiratory diseases are quite common, their total incidence being 27·57 per cent. Common cold or acute nasopharyngitis is the chief respiratory disease which is perhaps due to lowered resistance to the infection, the smoke of the factories and the temperature variation in the factory and outside.

The digestive troubles are as well frequent. The total incidence of these disorders is 21·86 per cent. The dyspepsia is the chief digestive complaint. It is probably due to high carbohydrate intake and lack of vitamin B complex and cellulose in the diet. The dysentery is mostly of amœbic variety. Toothache is a common complaint due to carious teeth.

Boils and abscesses, and skin diseases are present to an appreciable extent. The occupational skin diseases are not frequent. Conjunctivitis and trachoma are the chief eye diseases. Another common problem is the muscular and joint pains, either localised or generalised. I think it is a fatigue syndrome. The incidence of malaria is, as it could be found in the general population.

The cardiovascular, genito-urinary, metabolic, endocrinal and malignant diseases are negligible.

Mostly all are undernourished and underweight. They probably suffer from hypovitaminosis, and mineral deficiencies though the gross deficiencies are infrequent.

Pulmonary tuberculosis is the worrying problem specially of the industrial labour in Kanpur. The figures collected here are grossly incomplete as the general tendency of the workers, is to work till they are completely exhausted. Besides, they fear, they may not be allowed to go back to their work if they are once diagnosed. Some of the advanced cases leave the occupation and go away to their village homes. Usually early cases do not co-operate to be investigated on account of the above facts. In fact, the real incidence of tuberculosis is higher than what is recorded. It may be possible that they would co-operate when they start getting the cash benefits for sickness from November.

Loss of man-days—This is an important study as it affects economically the labour and the nation as well. Common cold, pulmonary tuberculosis, boils and abscesses, accidents, bronchitis, malaria, infective fevers, dyspepsia, arthritis and myalgia, dysenteries and diarrhœa in their order, take the highest toll of man-days of the industry. These eleven out of 50 causes of diseases are responsible for 81·7 per cent of the loss of man-days. These facts guide where our preventive efforts could be concentrated.

The average of the man-days lost per individual disease is still more interesting from the view-point of the social security as our efforts should be multiplied in the direction of reducing the period of sickness to the minimum. Considering the above diseases we find, tuberculosis of lungs and other forms, bronchitis and accidents take either a week or more than that whereas all the other diseases take at least four to five days on the average to be cured. There is hardly any disease which has taken less than three days to allow the insured person to resume his work. This indicates the amount of suffering that the labourer undergoes even for a common ailment and the security, this scheme will offer to him when he will be receiving cash benefits if he falls sick for three or more than three days.

Conclusions

The statistics form the vital force of such social security schemes hence a separate body of trained workers be organised to collect the various data in the direction that has been adopted in this paper as the medical officers are already doing work of treatment and certification. The latter consumes the greater amount of time. Such a planned study of the problem will indicate a positive approach towards the prevention of the disease and the reduction in the loss of man-days.

A periodical complete medical examination of all the labourers be made to keep the complete record of the health of each individual worker. This may be enforced by law as certain difficulties may be experienced in getting the co-operation from the employees and the employers both. The mass radiography of workers alone can help in detecting all the early and the other cases of tuberculosis. This may entail hard labour and high cost but in the long run it will be beneficial and economical.

During my domiciliary visits, I have entered such places which are, in fact store-houses of bacteria. The next phase of the social security scheme should be to construct healthy quarters for the insured persons against the compulsory contribution from the employers and employees if necessary. Such a legislation will be an ideal step towards the prevention of the disease.

Health propaganda through lectures, films, demonstrations and exhibitions will as well help a good deal in this direction.

The whole time team of medical men who would specialise in the subject of industrial and social medicine should be asked to take up this laudable work. A separate All-India Committee for Industrial and Social Medicine be instituted for the permanent guidance in this subject.

Summary

The working of the Employees State Insurance Scheme in Kanpur has been reviewed and various data regarding the rate of sickness, certified sickness, the man-days lost per individual disease collected from Rambagh Dispensary for a period of six months from March to August 1952, have been tabulated and discussed.

These data have been tabulated according to a special list of 50 causes of disease.

The various causes of the man-days lost due to the individual disease have been discussed and suggestions made to prevent and diminish their incidence.

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CASE NOTES

STREPTOMYCIN IN BUBONIC PLAGUE

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Bubonic plague broke out this year in the month of January in a fairly severe form, in Ganj and Jalalabad, the two villages situated on the border of Hardoi and Unnao districts of Uttar Pradesh. There were several deaths in these two villages from bubonic plague in untreated cases. The population in this area specially of Ganj was quite conscious of the severe nature of this disease and came quite early for treatment. All the patients were treated in their residences.

Diagnosis—The diagnosis of all these cases was based on clinical signs and symptoms, history of patients dying of fever and enlargement of glands and a concomitant history of rat death in houses.

Treatment—Streptomycin was given to all the cases cited. One gramme of streptomycin was dissolved in 2 c.c. of distilled water, given in one dose intramuscularly to adults and the same to be repeated after 24 hours if needed. There were 4 children who were given 0·5 gm. of the drug. The bubos were treated by local application of iodine ointment and fomentation. The rest of the treatment was symptomatic except in Case 1 and Case 2, where they also received sulphatriad in doses indicated in the Table.

Results—Streptomycin was given to the cases presented with very good results. The fever and toxæmia subsided in 24 to 48 hours and there was a sense of well-being amongst the patients, on the next day of

administration of the antibiotic. The duration of illness was cut short consderably. The total dose of the drug needed for defervescence and alleviation of symptoms ranged between 0·5 gm. and 2 gms. as shown in the Table. Only 4 cases (Cases 4, 7, 9 and 15) required a total of 2 gms. of the drug.

Case Reports

Case 4—Male, aged 25 years, when first seen was semiconscious with difficulty in speech, confused ideas and temperature of 104°·8F. After 1 gm. of the drug his temperature came down to 101°·0F. with improvement in his general condition. He was fully conscious, the speech was normal and mind was clear after 48 hours when he had received 1 gm. more of the drug. His temperature also came down to 98°·4F.

Case 7—Female, aged 18, whose temperature was 99°·8F., 24 hours after the first injection, was given the second injection of 1 gm. of the drug and the temperature touched normal the next day.

Case 9—Female aged 30, had 104°·2F. temperature, was in confused state of mind and had staggering gait. Her temperature came down to 101°·0 F. on the next day of the first injection of streptomycin. After 48 hours when she had received 2 gms. of the drug, her general condition showed marked improvement, her temperature touched normal, her gait was normal and she was mentally alert. The bubos, however, took 15 days to subside completely.

Case 15—Male, aged 20, with temperature 103°·4F. 24 hours later his temperature was 100°·0F. and after the second injection his temperature came down to normal and bubos subsided in 9 days.

Discussion—It will be observed that in this series of cases requiring 2 gms. of streptomycin, average number of days for the bubos to subside was 10 as against 6·8 of the rest and the maximum number of days in any one case was 15 as against 9 in the rest of the series.

Table Showing Analysis of the Cases Treated with Streptomycin and Cured

No.	*Age*	*Sex*	*Temperature before treatment started*	*Toxæmia*	*Site of bubos*	*Duration of disease in hours at the time of treatment*	*Streptomycin I. M. injection in gm. in single dose*	*Temperature after 24 hours of injection*	*Streptomycin injection after 24 hours of 1st injection*	*Temperature after 48 hours of treatment*	*Total Streptomycin in gms. given*	*No. of days in which bubos subsided*	*Remarks*
1	22	F	103°·2	+ +	Rt. Axilla	12	0.5	99°·8	0.5	98°·0	1	7	She had sulphatriad 16 gms. during the first 3 days. Dose: Sulphatriad 2 gms. stat. and 1 gm. 4 hourly.
2	8	Fc.	103°·8	+ +	Rt. Axilla	24	0.5	98°·0	...	98°·2	0.5	5	She had 8 gms. of sulphatriad in first 3 days. (Dose: 2 gms. stat. and 1 gm. 4 hourly) of her illness before Streptomycin was given
3	26	F	104°·4	+ +	Lt. Inguinal	24	1	98°·0	...	98°·2	1	8	
4	25	M	104°·8	+ + +	Lt. Axilla	24	1	101°·0	1	98°·4	2	9	He was semi-conscious and much confused. He had difficulty in speech
5	8	Fc.	101°·2	+	Rt. Inguinal	24	0.5	98°·0	...	98°·4	0.5	8	
6	30	M	103°·8	+ + +	Lt. Cervical	6	1	98°·2	...	98°·4	1	5	He was delirious from the beginning and confused
7	18	F	103°·2	+ +	Rt. Inguinal	12	1	99°·8	1	98°·2	2	7	
8	30	M	100°·6	+	Rt. Inguinal	48	1	98°·4	...	98°·4	1	7	
9	30	F	104°·2	+ + +	Lt. Axilla	24	1	101°·0	1	98°·2	2	15	She was confused and her gait was staggering when first seen
10	36	M	100°·8	+	Rt. Inguinal	12	1	98°·2	...	98°·4	1	7	
11	10	Mc	102°·6	+ +	Lt. Inguinal	8	0.5	98°·4	...	98°·4	0.5	6	
12	35	M	100°·2	+	Lt. Inguinal	72	1	98°·0	...	98°·4	1	9	
13	40	M	103°·2	+ +	Lt. Axilla	24	1	98°·4	...	98°·4	1	6	
14	32	F	101°·2	+	Rt. Inguinal	12	1	98°·0	...	98°·4	1	8	
15	20	M	103°·4	+ + +	Rt. Inguinal	24	1	100°·0	1	98°·2	2	9	
16	10	Mc	101°·8	+	Rt. Inguinal	10	0.5	98°·4	...	98°·4	0.5	5	
17	35	M	102°·8	+ +	Lt. Inguinal	24	1	98°·4	...	98°·4	1	8	
18	31	F	104°·0	+ +	Rt. Axilla	24	1	98°·0	...	98°·0	1	6	

It may be noted from the Table that Case 6 who was delirious when treatment was started with a temperature of 103°·F., required only 1 gm. of the drug for his temperature to come down to 98°·2F. His delirium had disappeared and mental state was clear on the second day.

Bubos subsided, in general, on an average in 7·5 days after streptomycin injection without going on to suppuration and requiring incision.

The notable feature of all these cases was that 1 gm. of streptomycin was given to adults in a single injection to be repeated after 24 hours if the temperature and toxæmia continued, instead of more frequent doses as recommended earlier (Ghosh, 1950; Fairley 1950). It was observed that there appears to be no need of administering the drug after the fever had subsided, as no recurrence of temperature or symptoms was noted in any of these cases during the course of disease.

This method of administration appears to be quite economical, convenient and specially suited to the rural conditions where the transport facilities are quite meagre.

The toxic manifestations of streptomycin were not noted in any of these cases. All the patients responded to streptomycin therapy and no case of drug resistance was encountered in this series.

Summary

1. 18 cases of bubonic plague treated with streptomycin are cited.

2. 14 cases required 1 gm. of the drug. This included a delirious case, whose delirium had disappeared and the temperature touched normal in 24 hours. Only 4 cases required 2 gms. of the antibiotic. All these cases were very toxic in the beginning and fever had not come down to normal 24 hours after the first injection. The average time for the bubos to subside in the first series was 6·8 days, in the latter 10 days and in all 7·5 days. No suppuration of bubos occurred and hence none required incision.

3. All cases were cured.

Acknowledgment—My thanks are due to Dr. H. N Shivapuri, Deputy Director, Medical and Health Services, U.P., for his kind permission to publish the article and Dr. R. Dwivedi and Dr. H. Ambwani for their valuable help in preparing the article.

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A CASE OF TETANUS

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S, a labourer, aged 38 years, came to this hospital on 17-12-51 for the treatment of spasm of the muscles of the face and body.

Previous history—The patient got an incised wound on the sole of the left foot on 1-12-51 and was treated as an indoor patient of the hospital. The wound healed up in course of 2 weeks with general antiseptic dressings and sulphanilamide tablets taken orally. No prophylactic serum was given. He was discharged cured on 13-12-51.

Present history—The patient gave the history that he felt difficulty in swallowing from the 3rd day of his discharge from the hospital and came again to the hospital on the morning of 17-12-51.

Physical examination—There was spasm of the muscles of the face (lock jaw) and other parts of the body and he could swallow medicine with great difficulty. There was stiffness of the muscles of the neck and of the leg. The case was diagnosed as tetanus as he had trismus, opisthotonus, risus sardonicus and also other classical signs and symptoms of tetanus. The possibilities of other diseases were excluded by suitable examination. The temperature on admission was 97°F.

Blood examination showed leucocytosis with polymorphs —84 per cent, small mono—15 per cent, and large mono—1 per cent.

Treatment

Immediately after admission, tetanus antitoxin serum 16,000 I.U. was given intramuscularly, as we had no more in our stock. The site of the wound was opened by crucial incision and enlarged sufficiently. The wound was dressed with tincture iodine fort. with gauze packed inside the wound. Bromide with chloral hydras mixture by mouth every 4 hours and 25 per cent magnesium sulphate solution 7 c.c. were given intravenously. The patient had no temperature on the first day but it began to rise from the next day.

Progress of the Case

18-12-51—The temperature rose up to 101·6°F. Intensity of spasms and their frequency and lock-jaw increased. Antitoxin 44, 500 I.U. given I.M. and other treatment continued as before.

19-12-51 to 21-12-51—The temperature continued. Intensity of spasm increased, with hurried respiration. Considering high polymorph count and temperture, soluseptasine 10 c.c. I.M. were given for 3 days. Antitoxin total dose given in 3 days 1,33,000 I.U. Magnesium sulphate 25 per cent solution given intravenously and other sedatives by mouth continued.

22-12-51 to 23-12-51—The temperature continued to vary from 99°F. to 101°F. One good sign noticed was that there was slight relaxation of the right extremities and the spasm was less in intensity. Antitoxin injected in 2 days 54,500 I.U. Quinine bihydrochlor grains 10 in 2 c.c. injected I.M. for 2 consecutive days.

24-12-51 to 25-12-51—The temperature continued to rise up to 99°F. General spasticity and all other signs and symp-

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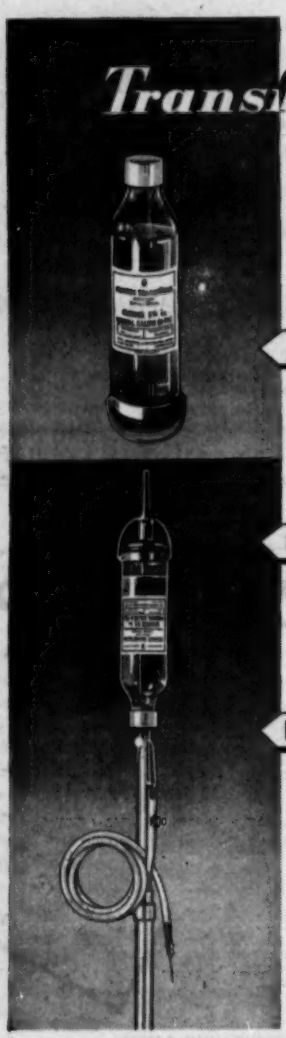

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toms of tetanus were same as on previous day, i.e., before injection of quinine.

Tetanus antitoxin was continued for another 2 days and further 40,000 I.U. were given.

26-12-51—Signs and symptoms of tetanus abated from this day. There was relaxation of the upper extremities but the patient could not move his lower extremities. Administration of antitoxin serum was stopped from this day. 25 per cent magnesium sulphate solution 5 c.c. I.V. was continued for another week.

27-12-51 to 28-12-51—The temperature touched normal though there was a slight evening rise upto 98°F. General condition was much better. The patient could swallow with much less difficulty. Spasm of lower extremities persisted to a milder degree. The patient was able to draw his legs up and could partly open his mouth.

3-1-52—There was general improvement but the temperature again rose to 100°F. Cough was present and scattered rales were found in the right lung. The patient was given M & B 693 for 3 days and the temperature dropped to normal.

5-1-52—The patient was much better. All the signs and symptoms disappeared except that he could not sit properly in bed until 10-1-52. He thus made a gradual but uneventful recovery. Iron tonics and vitamins were given to hasten recovery. The case was discharged from the hospital on 2-2-52 as fully cured.

Discussion

Total antitoxin serum given was 2,88,000 I.U. The case improved fully by antitoxin and 25 per cent magnesium sulphate solution I.V. Quinine has got no effect of spore bacillus as there was no response in temperature reaction nor was there any amelioration of other signs and symptoms of tetanus in this particular case [*cf.* Lahiri (1950) who reported improvement with quinine].

For want of sufficient stock of antiserum we could not administer sufficient quantity of antiserum at the earliest opportunity; otherwise, the case under report would have improved earlier. The treatment of the local wound is very important and must not be neglected as unless the focus of infection is checked no amount of antitoxin can be of much value.

Acknowledgment—I am grateful to Dr. N. G. Mazumder, M.B., C.M.O., of this Estate, for encouragement and valuable suggestions regarding treatment and kind permission to report the case.

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INTUSSUSCEPTION—INTESTINAL CAST—NATURAL TERMINATION

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By intussusception is meant the invagination of the proximal coil of intestine into the distal one. Very rarely retrograde intussusception may occur due to reverse peristalsis before death.

Ætiology—Infants under two years are commonly affected, then children and rarely adults. Mostly no ætiological factor is found in children. It is generally stated to be due to irregular violent peristaltic movements of the bowel to get rid of some irritable cause like hard fæcoliths, round worms, submucous lipoma, polypus, papilliferous carcinoma, inverted Meckel's diverticulum, etc. Change of diet and inflamed Payer's patches are considered to be the main ætiological factors occurring in cases of infants. In a few, injury over the abdomen or severe strain during jumping, etc., is responsible.

Pathology—Intussusception is made up of three parts: (1) Entering or internal layer. (2) Returning or middle layer. (3) Ensheathing or outer layer. The outer or ensheathing layer is called the intussuscipiens. The invaginated portion—the internal entering and returning middle layers—form the intussusceptum. The neck is the junction of the entering layer with the mass. The part which advances is the apex. A portion of mesentery is also dragged in by the entering layer and intestinal obstruction is brought about by the traction on mesentery which makes the orifice of the intussusceptum almost slit-like due to congestion and œdema. The damaged intestinal wall is susceptible to invasion by organisms like B. coli and peritonitis results due to transmigration of organisms from the damaged gut wall. Serious signs and symptoms like perforation, gangrene or rupture of the gut are due to the constriction of the vessels and obstruction later on. In some peritonitis is localised and confined to the neck of the intussusceptum wherein the serous coats of entering and returning layers form firm plastic adhesions. In others diffuse peritonitis sets in, ending fatally in most cases.

Varieties—1. Ileo-caecal is commonest occurring in about 44 per cent of cases. 2. Ileo-ileal 30 per cent. 3. Colo-colic 18 per cent. 4. Ileo-colic 8 per cent. Ileum protrudes into colon, the ileo-caecal valve and cæcum both prolapse into the ascending colon.

Signs and Symptoms—Signs and symptoms vary widely in different cases and in acute and chronic conditions. Acute intussusception is the most common cause of intestinal obstruction in infants below two years. Sudden severe paroxysmal pain in abdomen, the child drawing up legs on abdomen during the pain and lying listless during remission of pain, and vomiting are characteristic. Abdomen not much distended, is slightly tender and resistant, with a lump felt mostly in the left side. The pain soon becomes continuous and diffuse. Constipation appears in some or frequency of motions tinged with blood and mucus in others. When peritonitis sets in the child looks much toxic, there is sweating with thready rapid pulse. Collapse soon follows. Once in a while sudden relief of signs and symptoms occurs due either to spontaneous reduction or by sloughing off of the intussusceptum. Chronic intussusception occurs in adults commonly due to carcinoma of the colon with gradual onset and paroxysmal attacks of pain becoming frequent and prolonged with

vomiting. Bowels become irregular with occasional passing of bloody mucous discharge. The abdomen feels soft or slightly distended, not tender, with visible peristalsis. Symptoms resemble more of subacute enteritis or chronic obstruction than that of strangulation. It may end fatally due to acute onset of obstruction or peritonitis.

Terminations—Unrelieved, the symptoms aggravate rapidly with high toxicity, restlessness, severe pain, absolute constipation, distention of abdomen all due to toxic absorption and rapidly spreading gangrenous process of gut with perforation and fatal peritonitis. Rarely the blood supply of the intussusceptum may be cut off by the strangulation of the vessels and the gangrenous intussusceptum may be cast off per anus thus bringing in natural cure. Still rarely the intussusceptum may by itself get disengaged.

Sequelæ of natural cure—Mostly the patients who had spontaneous cure of intussusception, suffer from vague abdominal pains, poor appetite, irregular bowel action due to chronic intestinal obstruction resulting from stricture of the bowel, interadhesions between peritoneum, omentum and bowels.

Case Report

No. 335, aged six years, admitted on 29-7-50 for intestinal obstruction.

Complaint—Pain in the abdomen and constipation since three days.

Family history—Parents, four sisters alive and healthy.

History of previous illness—No previous history of dysentery, diarrhœa, round worms, or any acute illnesses.

History of present illness—She did not pass any stool since three days and was having slight attacks of abdominal colic for two days. Since yesterday the paroxysms of pain increased in severity, frequency and duration with slight distention of the abdomen. She was given soap water enema, with the result of four small hard fæcal lumps being passed. She was given deworming treatment with castor oil in the morning but she vomited castor oil immediately after its administration. Glycerine enema was then given, only the fluid returned. This was followed by turpentine enema as there was distention and water only came out. These treatments were given while the patient was at home. The symptoms grew worse and she was brought to the hospital.

Condition on examination—The abdomen was distended, tympanitic, slightly rigid, and tender more on the left side; the lower abdomen was feebly moving with respiration; there was no visible peristalsis; a small lump was felt in the upper part of the hypogastric region on the left side, the tongue was coated and slightly dry, the pulse was 140, and the respiration 30 per minute. The patient was experiencing severe paroxysmal attacks of pain. She was given I. V. glucose saline, penicillin streptomycin combined injections, a carminative mixture with tincture hyoscyamus and opii; only sips of glucose water were allowed per mouth; turpentine stupes applied. She had a restless night. The temperature varied between 100° and 101°F.

On 30-7-50 the general condition was the same, there was no vomiting and no stool. The same treatment was continued. Pulse was 130-120 per minute, temperature 100°F.; high flatus tube was passed in the evening and a little gas escaped.

On 31-7-50 in the early hours of the morning the patient passed six round worms 4 to 6 inches long. Abdominal distention was less and the abdomen was felt a little softer and it was less tender. The temperature was 99°F and the patient looked much relieved of toxicity and restlessness.

On 1-8-50 she passed 8 more round worms, the abdomen was soft and moving with respiration and there was no tenderness. The pulse was 90 per minute. She complained of no pain.

From this day onwards the bowels moved regularly every day two to three times passing a greenish slimy slough. On examination after washing, this slough was found to contain degenerated intestinal epithelium.

On 5-8-50 the girl drew the attention to a blackish green substance protruding from the anus. It was pulled out gently with forceps and the whole thing came out easily. It was examined and found to be the gangrenous slough of the intestine measuring 3½" in length. No mass or tumour felt at the end or on the sides. The girl was discharged on 6-8-50 on request.

The patient was followed up for two years and the last examination was made on 20-7-52. The abdomen is quite normal, there is no tenderness neither any lump felt in the abdomen; no history of pain in the abdomen or discomfort, the bowels are moving regularly every day and the patient has good appetite and feels quite well.

Summary

A case of acute abdomen with signs and symptoms of intestinal obstruction was admitted on 29-7-50. The abdomen was distended and tender, a small lump was felt in abdomen on superolateral aspect of the hypogastric region; no visible peristalsis was observed. She was put on I. V. glucose saline, antibiotics, sips of glucose water only being allowed per mouth. The girl was in acute condition for 30 hours. High flatus tube was passed. On third day she passed flatus and round worms. After passing round worms she felt immediate relief. On the eighth day gangrenous intestinal cast of 3½" was passed. It did not reveal any tumour. The patient was followed up for two years to note any after-effects. The girl is quite normal with regular bowel action, good appetite and no masses felt in the abdomen.

Conclusion

Evidently the ætiological factor of intussusception in this particular case is round worms obstructing the bowel. To the luck of the girl she vomited immediately the castor oil was given. Otherwise, there might have been fatal perforation and peritonitis. With the passage of the round worms the cause of obstruction was removed naturally and the patient began passing flatus and fæces with immediate relief of the signs and symptoms. The very rare natural termination of intussusceptum occurred with best after-results having no sequelæ like fibrous stricture, bands, adhesions etc., observed up to two years after the incidence.

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CALCUTTA, MARCH, 1953

THE CENTRAL COUNCIL OF HEALTH FOR INDIA

At the instance of the Union Health Minister, a Central Council of Health for India has been constituted by the President of the Indian Republic. The membership of the Council is limited to the Ministers of Health of the different States. The first meeting of the Council was held at Hyderabad on the 29th, 30th and 31st January, 1953, under the Chairmanship of the Union Health Minister Srimati Amrit Kaur. Although this is the first meeting of the Central Council of Health, since 1937 at least three meetings of the Health Ministers of the States were held in different parts of the country

In all the previous meetings along with the one recently concluded various questions affecting medical relief and public health measures for the people of this vast country engaged the attention of all who assembled in these conferences. Prior to the formation of the new Health Council there was functioning a Central Advisory Board of Health. During the last five years since freedom was attained by our people, different State Governments as well as the Central administration increased their allotment of funds for the improvement of medical relief and extended the operation of public health activities. But the country with its vast population, steeped in ignorance, superstition, illiteracy and abject poverty presented a huge problem and these funds were not sufficient to cope with the needs for ensuring better health for the people.

The ultimate aim of all progressive elements throughout the world is not only to fight diseases, as and when they are manifest, but also to concentrate more attention on the preventive measures so that the incidence of disease might be effectively controlled and a condition of definite positive health ushered in. At the present moment, the people's environmental conditions are at such a low level that unless rapid strides are made for the economic regeneration of the vast bulk of our population which lives mostly in the rural areas, it would be difficult to plan any effective programme for the healthy growth of the nation. Ill-health indirectly affects not only the economy of the country but also the present main problem of India viz., increase in the production of foodgrains. With this background it is a very happy augury that the Ministers of Health discussed the question of environmental hygiene which is a vital problem for our people. This question has been referred to a Special Committee with directions to evolve a scheme for the practical execution of the elementary sanitary measures to be adopted by the people themselves, the village and urban self-governing institutions as well as the State Governments. Although it is felt that without improvement in the economic standard of our people, mere legislative action will be of no avail for awakening health consciousness amongst the masses, it is hoped that out of the labours of the Special Committee, a comprehensive standard plan will be evolved aiming at the ultimate introduction of these measures.

It is of interest to note that subjects like medical education, both modern scientific system as well as the indigenous and homœopathic, formed the subject matter of discussion of the Council. It is indeed gratifying to note that the Council expressed its unanimous verdict in favour of the maintenance of the uniform 5 years' university course of study for obtaining minimum qualification in the modern scientific system of medicine. A controversy seemed to have developed over the question of the uniformity of having 5 years' degree course for the indigenous system of medicine and homœopathy. It is gathered that the question has been deferred to a future date. The Council unequivocally decided that scientific education under no circumstances should be lowered to get more doctors for the village people. We were very much interested to learn that sanity prevailed in the discussions of the Council and it unanimously decided not to sacrifice quality at the altar of quantity. It would have been very helpful if the same ideology could also be maintained for the other systems of medicine. There were some who wanted to exalt Ayurveda to its pristine glory which prevailed 700 years ago. But it was curious to observe as revealed from Press reports that some of the advocates were keen to provide cheaper medical aid through the agency of Vaids and Hakims in the villages. They held the opinion that this could be achieved by providing shorter courses of 3 years for indigenous medicine to effect mass production of practitioners. There were some who also wanted to utilise the existing Vaids and Hakims by giving them a sort of training to work as auxiliary personnel for the rural areas. We must confess that we do not agree to make any distinction between the lives of those who live in villages under trying circumstances and those who live in the cities with better conditions. It is amazing that still there are persons who think of providing different kinds of medical relief facilities for the people of the two categories.

The Council appreciated the efforts to reorientate the lives of the people of this country as revealed in the first Five-Year Plan in which public health and medical relief have been given a place. But the Council regretted enough money had not been provided for the purpose so as to bring in a noted change in the outlook of the people so far as health measures are concerned or to bestow a lasting benefit to the people in accordance with the Planning Commission's report. It would have been very helpful if more funds could be placed at the disposal of the States for extension and improve-

ment of public health and medical relief facilities particularly in the rural areas.

It was decided by the Council to rid the country of the menacing scourge of malaria by fighting it on various fronts with the assistance of the UNICEF. Various States are going to have more teams to work out the National Malaria Control Programme on a wider basis. It is expected that within the next few years there will be tangible improvement in the state of affairs with the periodical use of D.D.T. emulsion in every dwelling house as it would effectively eliminate the malaria-bearing mosquito—anopheles—from the household. The former conception of fighting the larva by attacking the shallow water-logged places has changed. Better scientific success by the use of D.D.T. which scares away the mosquitoes has been achieved in preventing infection.

The mass B.C.G. campaign that had been going on in the country was also reviewed and it was expected that with the fullest co-operation of the people, the various State and the Central administration the entire population below 20 years of age would be tested for any infection and eventually protected with B.C.G. vaccination within the next five or six years. Although there is controversy regarding the degree of success of the B.C.G. campaign in different parts of the world, India has undertaken to carry on the mass campaign and the results will demonstrate to the people of the world the value or otherwise of this campaign.

It is regretted that the question of nutrition, provision for supply of pure food and drugs for the people at large was not reviewed with sufficient interest in the meeting of the Council. With the discovery of large centres for the manufacture of spurious drugs in big cities, it is high time that effective measures are taken by the Central Government as well as the State Governments to put their foot down to the machination of unscrupulous persons who indulge in manufacturing spurious drugs to play with the precious lives of people. We do not know how this escaped the notice of the recent conference.

It is hoped that with the progress of time the different Ministers of Health in the States will be able to concentrate more on cognate matters for the steady growth of the nation and necessary funds will be provided for taking effective measures to regenerate the health of our people. The whole country awaits the developments in the health forum of our country as a result of the deliberations of the first meeting of the Central Council of Health. Let us hope when the Council meets again at the end of the year it will be able to show that it has crossed several milestones in stabilising the health resources. We also hope to find definite signs that peoples' representatives and the Governments are going ahead with all the earnestness at their command to equip our people with a model health so that they might find a suitable position amongst the healthy nations of the world.

BLIND RELIEF CAMPS

We feel it necessary to draw the immediate attention of the Government of India, the State Governments and other authorities concerned to the resolution passed at the last All-India Medical Conference in regard to blind relief camps[1]. It is encouraging to note that the learned members of the Indian Medical Association took this important matter seriously, in the best interests of the people. The Patna Conference has certainly given a lead in this respect to the people and their representatives in the Government and Local Bodies.

It is true that a very large number of persons is in need of treatment for senile cataract. It has also to be admitted that there is a shortage of eye hospitals in this country. The problem of tackling such patients is rendered unnecessarily difficult because of the erroneous idea amongst a large majority of lay people that cataract surgery should not be undertaken in the summer.

It must be stressed that cataract operations should only be allowed to be performed by qualified and trained ophthalmic surgeons and with all necessary aseptic and antiseptic precautions. In any modern eye hospital or clinic, at least 95 per cent of patients regain useful vision after cataract operation. Under such circumstances, it is a folly to take unnecessary risks in trying to help a so-called blind man even in rural or outlying areas. After all the eye of a poor man is as precious if not more precious to him, as compared in the eye of a person in affluent circumstances.

As more and more qualified and trained young ophthalmic surgeons are produced now-a-days in the big cities, the State Governments should utilise the services of such persons by establishment of ophthalmic wards in the mofussil hospitals. If every district and sub-divisional hospital is provided with an equipped ophthalmic ward and a pathological laboratory and if patients are encouraged to undergo cataract operations throughout the year, the problem would be made much easier. Even then, it may be necessary to form mobile squads composed of experts and their trained assistants to cope with the situation.

It must not be overlooked that proper pre-operative and post-operative measures are more important for the success of the operation, in comparison to the technique of operation even if that be done by the accredited experts. The 95-98 per cent success attained in fully equipped eye hospitals does not depend solely on the technique of the trained surgeons. We feel so strongly on this subject that we think legislative measures should be undertaken whereby establishment of blind relief camps is governed by laws made to protect the interests of particularly the poor people in rural areas of this vast sub-continent.

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1. *J. Indian M. A.*, 22 217-18, 1952.

CURRENT MEDICAL LITERATURE

Cerebral Symptoms in Cardiac Infarction

Usually the first and foremost symptom of cardiac infarction is pain; but occasionally this is slight or absent, or is rapidly superseded by other symptoms. Notable among these are unconsciousness, convulsions, hemiplegia, or other evidence of local brain injury. Severe pain can itself cause syncope, and it is more likely to do so when the blood-pressure is also low, as a direct cardiac effect. In a large series of cases of cardiac infarction in American Servicemen under 40 years of age, Yater *et al* (*Am. Heart J.*, **36**: 481, 1948) noted unconsciousness in 11 per cent, and convulsions in 4 per cent; and all the patients with convulsions died. In the elderly, cardiac infarction may manifest itself in transient or long-continued unconsciousness and hemiplegia, and the true diagnosis may then be revealed only by necropsy. In five such cases described by Cole and Sugarman (*Am. J. Med. Sc.*, **223**: 35, 1952) necropsy brought to light no evidence of a cerebral vascular lesion, and these workers suggest that the neurological disturbance may have been due to ischæmia and anoxia from fall in blood-pressure, associated with narrowing of the cerebral arteries. Syncope and convulsions may be caused by slow heart-rate due to heart-block or even extreme sinus bradycardia, and also by auricular fibrillation and flutter and the ventricular and auricular tachycardias. Primary ectopic tachycardia (which may cause cardiac pain and subsequent inversion of the T wave) has to be distinguished from an abnormal rhythm complicating infarction. Similarly chest pain and syncope due to aortic stenosis may be thought to indicate coronary thrombosis, especially as deep inversion of the T wave is usual; but this mistake can be avoided by recognising the clinical signs of the valve lesion, and by the pattern of the T wave and S-T segment which differs from that myocardial ischæmia.

Cerebral symptoms starting days or weeks after cardiac infarction may be due to an embolus from the left ventricle or to arterial disease of the brain. The heart-attack itself may cause relatively litle pain, for which the patient does not seek medical advice. In such a case, when the patient is first seen by the doctor with, say, hemiplegia, the original heart condition may easily be overlooked unless the doctor is on his guard.—*Lancet*, **1**: 652, 1952.

Pericarditis

Herrmann and others (*Am. Heart J.*, **34**: 641, 1952) from analysis of clinical and laboratory data of 130 cases write that pericarditis must be considered as a possibility, in obscure conditions, if it is to be recognized as often as it occurs. The history or findings of ætiological conditions that commonly cause pericarditis should alert the physician and render the condition open to suspicion. The clinical case study may or may not reveal an ætiological factor and sometimes extensive clinical investigation may fail to reveal the genesis.

The cardinal symptom of pain or distress may be characteristically propagated to the left shoulder or neck or may be only a vague distress in the precordium or the epigastrium. Dyspnœa may be the equivalent of, substitute for, or may follow the pain. The pathognomonic sign is the pericardial friction rub which may often be felt or heard when the breath is held in expiration. Bulging of the precordium or the intercostal spaces or distention of the neck veins may be noted. The sharply demarcated and widened cardiac or upper retrosternal dullness is rarely demonstrable. The auscultatory finding of the friction rub and/or very distantly muffled heart sounds are the most reliable clinical signs. Further data obtained by fluoroscopy, teleradiography, kymography, electrokymography and electrocardiography are the most acceptable accessory diagnostic aids.

The treatment of pericarditis is determined by the ætiological factor and the anatomic changes that have been established. Antibiotics used against primary infection often prevent and or abort a pericarditis. Serous effusion only occasionally require paracentesis. Purulent exudate usually requires surgical drainage. Two cases of tuberculous pericarditis have convinced us that pericardiectomy should be considered early, immediately after a course of streptomycin and PAS therapy. Aureomycin may be considered as worthy of trial in patients with acute idiopathic or nonspecific pericarditis.

ECG Significance in Electrolytic Disturbances

Merril (*Am. Heart J.*, **43**: 634, 1952) gives in the following lines the summary of his observations:

Magnesium excess and deficit produce no clearly defined change in the electrocardiogram which is of value clinically.

Calcium excess exhibits no reliable electrocardiographic aberrations. Calcium deficiency produces an anomaly which may be useful in conjunction with a clinical suspicion but which is duplicated by many other conditions. The prolonged Q-T interval due to increased S-T duration with a normal T width is to be distinguished from the prolonged Q-T interval due to a widened T wave associated with potassium deficiency.

Potassium intoxication is quite reliably represented by the electrocardiogram at blood levels above 7 meq. per liter and fairly so at 6·5 meq. per liter if a base line electrocardiogram has been taken to determine increase in the height of the T waves. The electrocardiogram indicates potassium concentration and does not show total potassium content which may actually be low.

Potassium deficit with a blood level below 3·0 meq. per liter is accurately depicted by the electrocardiogram in about 80 per cent of cases. The picture is far from specific, and clinical data are of great importance in interpreting the electrocardiographic abnormalities. At times, the electrocardiogram represents the body deficit more accurately than the blood potassium does, especially in renal disease. However, in some cases, levels as low as 0·9 meq. per liter have been reported with normal electrocardiographic findings.

The electrocardiographic signs of hyperpotassæmia may be normalized in animals by injections of hypertonic sodium chloride without lowering the serum potassium concentration.

Some of the possibilities as to the cause of the electrocardiographic alterations are presented.

Dietary Aspects of Cardiovascular Diseases

Lefkovits (*Am. Pract. & Digest Treat.*, **2**: 1056, 1951) writes that diet is of primary importance in treating heart disease. Oedema is due chiefly to sodium retention, so that salt restriction is of signal importance.

Salt substitutes may be used. Cation exchange resin per os is of great value in reducing salt absorption. If the low salt syndrome appears (suppression of urine), salt must be given. The author permits cardiac patients to drink all the water they desire. Obesity should be corrected. Undernutrition is beneficial. Distention of the stomah and bowel brings

about a vagovagal reflex with decreased blood flow in the circumflex branch of the left coronary artery. Vitamins are emphasized. The control of hypercholesterolæmia by low fat, low cholesterol diets is advocated. Five or six small meals are preferable to three large meals. He reduces coffee to one cup per day. Lack of vitamin B probably represents one factor in the development of congestive heart failure, so that concentrates of B_1, B-complex and vitamin C should be used.

Cation-Exchange Resins in Œdema

Emerson and others (*Arch. Int. Med.*, **88**: 605, 1951) investigated the immediate and long term results of oral administration of cation-exchange resins in 14 patients with œdema from various causes. They concluded that this was a practical and effective procedure for reduction of œdema by removal of sodium from the intestinal tract. The amount of sodium removed ranged from 0·25 to 0·8 meq. per gram of resin, sometimes reaching higher levels for short periods. This amount was only partially dependent on the sodium ingested. It was possible to remove sodium from body fluids and thereby achieve a negative sodium balance. A daily dose of 45 gm. of resin may be expected to remove approximately 2 gm. of sodium chloride. Larger doses may be given but are likely to be poorly tolerated because of their bulk. Since most resins remove more potassium than sodium, at least 1·3 meq. of potassium (equivalent to 0·1 gm. of potassium chloride) must be supplied per gram of resin administered. Small calcium supplements should probably be given in addition. The authors caution against the use of resin-therapy in patients with renal insufficiency, since the loss of base in the fæces must be compensated for by renal ammonia and acid production or systemic acidosis will result. The advantage of resin therapy is that it withdraws sodium slowly and steadily over prolonged periods without the sudden fluctuations induced by most diuretics. The disadvantages lie in the large quantity of material that must be ingested daily, the possibility of gastric irritation, and the danger of inducing acidosis in patients with renal disease, or potassium depletion if potassium supplements are not given.

Nicotinic Acid and Circulation in Extremities

Schultz (*Klin. Wochenschr.*, **30**: 8, 1952, *Ref. J.A.M.A.*, **148**: 1450, 1952) believes that nicotinic acid stimulates the peripheral circulation only in the head and the upper part of the body including proximal portion of the extremities. However, some clinicians think that circulation in the ends of the extremities is also stimulated by nicotinic acid, and that, therefore, this acid and its derivatives may be used in treatment of impaired circulation in the fingers or toes. The author measured the skin temperature of the fingers and toes under conditions that would disclose vasoconstriction as well as vasodilatation. His experiments revealed that, whether nicotinic acid or its derivatives were given intravenously, intramuscularly or orally, they did not increase the blood perfusion of fingers or toes. On the contrary, the finger temperature often decreased in healthy subjects by as much as 10°C and more. Observations on patients with disturbances in the peripheral circulation also proved that nicotinic acid preparations are not suitable for the treatment of impaired circulation in fingers and toes.

Priscol in the Treatment of Peripheral Vascular Disease

Frank and others (*Ann. Int. Med.*, **35**: 19, 1951) write that twenty-two cases of peripheral vascular disease of various types were treated with priscoline. The average daily oral dose was 200 to 250 mgm. taken in divided doses. The highest oral daily dose was 500 mgm. taken in divided doses. The average intravenous dose was 50 mgm., given three to four times a day. The greatest intravenous dose was 240 mgm., given in doses of 30 mgm. every four hours. All patients exhibited increased collateral circulation as demonstrated by temperature studies. Intermittent claudication was abolished or improved in most patients. All patients claimed that their feet were warmer and that they felt much better than before treatment. In cases of thromboangiitis obliterans and frostbite all ulcerations healed. Contrary to expectations, fairly good results were obtained in the arteriosclerotic group. In the patients with thromboangiitis obliterans, good results were obtained with either large oral or relatively large intravenous doses. There were no alarming side reactions. Of two known cases of duodenal ulcer, one experienced epigastric pain controlled by anatacids, while the other had no complaints. A third patient who gave no history suggestive of duodenal ulcer experienced anorexia, epigastric pain and nausea. A subsequent gastrointestinal series revealed an active duodenal ulcer. Symptoms were controlled by reducing the dosage of Priscoline and giving ulcer therapy.

Nutrition and Aging

Kirk (*Nutrition Rev.*, **9**: 321, 1951) writes that the intestinal flora in aged persons is different from that in youth and this may exert some effect especially upon the thiamine supply. Probably the idea of the synthesis of thiamine by intestinal bacteria is false and it is more probable that certain bacteria ingest a high percentage of thiamine taken orally so that it is lost in the fæces. Old persons usually showed low blood ascorbic levels without signs of scurvy, so that the phenomena may well be a physiological one. Where either or both vitamin A and thiamine show lowered blood levels in the aged, clinical improvement follows their oral administration. The reduction of muscular tissue in old age is associated with decreased caloric requirements. It now appears that elderly persons require more protein intake to maintain nitrogen equilibrium,—about 0·7 gm. of protein per kilogram of body weight. A negative nitrogen balance is often due to disease which becomes increasingly common after 60. The catabolic influene of adrenal corticosteroids remains unchanged from youth to old age, whereas the anabolic androgens and œstrogens decrease and this is one theory advanced to explain the tissue breakdown in elderly persons. Simple inactivity may also be a factor in the physiological atrophy of muscle. So far as life extension is concerned, we have practically no data derived from human subjects. In rats, however, a notable increase of life span was produced when the individual rat, during its growth period, was restricted in calories.

Houssay Phenomenon in Man

William (*Diabetes*, New York, **1**: 37, 1952, Ref. *J.A.M.A.*, **149**: 398, 1952) reports on the occurrence of pituitary necrosis in a diabetic woman, aged 27, in the third month of pregnancy. Prior to her admission to the hospital the patient had repeated episodes of hypoglycæmia despite reduction of the daily insulin dosage from 60 to 15 units. On admission to the hospital she was unconscious and must have been in this state for 12 hours. After the rapid, intravenous administration of 3,400 c.c. of dextrose, her urine had become sugar-free, but two hours later it contained sugar (4 plus) and a trace of acetone. She then was given 10 units of regular insulin with an infusion

of dextrose, and in response to this treatment the urine again became sugar and acetone-free. Because of the repeated hypoglycæmia before admission, the need for huge doses of dextrose intravenously in the hospital, and the sharp response to 10 units of regular insulin, the possibility of loss of pituitary function was considered when the patient died 37 hours after admission, without regaining consciousness. At necropsy the pituitary was twice the normal size, and a large part of the gland had been destroyed by hæmorrhage. Pituitary necrosis had resulted in intractable hypoglycæmia with extreme sensitivity to insulin, and finally in death. The condition can be compared to the situation produced experimentally by the animal experiments of Houssay, in which he removed both the pancreas and the pituitary. The evidence presented in the author's case appears to justify the conclusion that it represents one of the few recorded examples of Houssay phenomenon in man.

Drugs Against Airsickness

Chinn and others (*J. Aviation*, **22**: 535, 1951, Ref. *J.A.M.A.*, **149**: 196, 1952) write:

The effectiveness of scopolamine hydrobromide and of diphenhydramine (benadryl) in preventing motion sickness has been well documented. It has also been reported that a mixture of these two drugs provides excellent protection with smaller amounts of each one. Recently, significant protection against motion sickness has been obtained with other drugs. Scopolamine aminoxide (scopodex) hydrobromide tested by the simulated turbulance technique was found to be superior to dimenhydrinate (dramamine); trihexyphenidyl (artane), an antispasmodic used in Parkinson's disease, chlorcyclizine hydrochloride (perazil), and 10-α-methyl-β-dimethylamino-ethyl)-phenothiazin hydrochloride ("lergigan"), both long-acting antihistaminics, have given significant protection against seasickness. It was decided to compare these preparations with the scopolamine-diphenhydramine mixture. The efficacy of the drugs was tested during regular navigation training flights. In a comparison in over 3,000 subjects, this mixture consistently gave protection against airsickness equal to or greater than any other preparation tested. The side-effects of this preparation were minimal, consisting mainly of a slight increase in blurred vision and dry mouth. The mixture was superior to 2 mgm. of scopolamine aminoxide and to 50 mgm. of chlorcylizine hydrochloride. It showed somewhat better protection against nausea and vomiting than did the scopolamine aminoxide diphenhydramine combination, although this was not statistically significant. There was no difference in the effectiveness of "lergigan" and of the scopolamine-diphenhydramine mixture. Further comparison of these two preparations would be desirable, since the duration of action of "lergigan" has been reported to be long, which would enhance its value in long flights.

Heat Sensitivity Due to Autonomic Drugs

Litman (*J.A.M.A.*, **149**: 635, 1952) writes that under circumstances of elevated environmental temperatures, sweating protects the body against hyperthermia. Many recently developed drugs 'artane' used in Parkinson's disease and benadryl tend to inhibit sweating. Various other antispasmodics and possibly several of the antihistaminics have the same anhidrotic action. Such antispasmodic and antihistaminic preparations should be used cautiously in patients exposed to extremes of heat lest heat stroke results.

CURRENT TOPICS

CONFERENCE OF ASSOCIATION OF OTO-LARYNGOLOGISTS

The fifth annual Conference of the Association of Oto-Laryngologists of India was held at Patna in December 22-24, 1952. Prof. D. Ram, Chairman of the Reception Committee, welcomed the delegates and visitors in a cordial speech. Next, the Governor of Bihar, Sri R. R. Diwakar, formally opened the conference. Sir Deo Saran Singh, Minister, Medical and Public Health, Bihar, inaugurated the scientific session of the conference. Dr. S. Roy, M.P., presided and in course of his address, said,

"Upgrading the hospitals by improving the staff and equipment, specially those hospitals which are connected with teaching institutions, is long overdue. Rightly enough according to the suggestions of the Bhore Committee, the Government has started taking measures in that direction. The task in itself is quite a vast one and only a very small fraction of the whole problem has been touched so far. Administrative red-tapism and step-motherly attitude towards this important branch of medical science should not be allowed to stand in the way. Most of our institutions which are already in existence for more than quarter of a century, need upgrading badly and quickly. The tendency prevalent in our country to open a special department with absolutely meagre and quite inadequate equipment should be deprecated. The initial energy exhibited in opening such a special department is soon exhausted and the infant department remains without any sign of growth. The usual plea of non-availability of necessary funds is adduced with great force and the whole question of improvement and development becomes a minor point in the administrative machinery of such institutions. In this connection I am reminded of the opinion often expressed by our doctor premier of West Bengal, Dr. B. C. Roy, that "want of funds never stands in the way and money is never the biggest problem." Where there is a will there is a way.

I refuse to believe that in India to-day there is a great dearth of charitably disposed rich men to whom an appeal for help in a benevolent humanitarian work will go unheeded. What is often wanting in this matter is a real selfless spirit and a properly constituted organisation. The shadow of death duty in western countries has materially helped many industrialists and businessmen to contribute handsomely towards the establishment of new wings of hospitals, endowments for original research and various other charitable works. We in India are soon going to have an Estate Duty bill passed by our Parliament. And if the government makes provision for allowing a public charitable gift executed even upto the dying day of the benefactor to be considered legally, free from the tentacles of such duty, it will swell the rank of such generous men who have made their names dearer to the suffering humanity.

In some States the universities and the various faculties of medicine have shown inordinate hurry in distributing such diplomas as D.L.O., M.S., etc., to their so called postgraduate students. In all seriousness, I would like to cry halt to this hurried production of immature specialists who will be the future teachers of our country. It would not be impertinent to ask how many of these hospitals and colleges are adequately equipped for proper undergraduate work, leave alone the postgraduate, with the added facilities for research? How many of their students have proper basic knowledge of the

subject to materially benefit by higher postgraduate lectures? And lastly, though it is a rather delicate matter, but nevertheless quite pertinent in this connection, I would like to ask, how many properly qualified personnel in their staff with professional experience and original work to their credit can they boast of?

It is gratifying to note that in the Five-Year Plan the central government has, quite rightly, included such upgrading of existing hospitals, and 47.38 crores of rupees are estimated to be spent in the medical and public health plans. I wonder what proportion of this amount will be available for upgrading special Oto-Rhino-Laryngological departments in the hospitals in the different States. To improve the standard of Oto-Rhino-Laryngology in this country and to be able to adequately meet the requirements of this vast sub-continent we must have, within a reasonable period, a Central National Laryngological Institute where only postgraduate teaching and original research work would be undertaken. It is not enough to open a special Oto-Rhino-Laryngological department as a part of a general hospital. In that case, such a special department will not get proper scope and freedom for full and adequate development.

In the past decade great interest in clinical audiology has been taken and the importance of the subject is recognised in all progressive centres of Europe and America. As a matter of fact, the first International Audiological Conference was held in September 1950 at Stockholm where many illuminating papers with constructive suggestions were read by notable otologists from various countries.

It is high time that we must take up at least a good portion of that programme and implement some of the conclusions arrived at. Some of the papers dealt with details of establishment and organisation of planned State Audiology Centre. Our Association has already drawn pointed attention of the Union Government to the immediate necessity of planning and organising such aural rehabilitation work. In a backward country like ours where proper census of such afflicted people are not easily available and where co-operation of social workers on allied lines is not easily forthcoming the task is, I must admit, quite difficult. The Union Government should start taking lead in a proper and generous way to organise the work and utilise the slender voluntary efforts that are being made so far in a more or less haphazard manner.

The fundamental requirements for such an organised attack on the problem of preservation and restoration of hearing requires help from research workers on allied science. The development of electro-accoustical instruments for more acute and finer measurement of deafness, and the employment of electro-accoustical science in the service of the afflicted humanity by providing a suitable aid for hearing have greatly facilitated the work of rehabilitation.

Within the last three or four years the growing interest in fenestration operation, the expanding demand for improved hearing aids and the evolution of promising techniques of research in psycho-accoustics have made it possible for the electro-accoustical science to grow. With the gradual realisation of the clinical limitation of tuning fork test and pure tone audiometric technique more and more attention is being paid to what is now well known as articulation test. These modern developments in auditory tests should be properly implemented in the routine work of an otological clinic in aural rehabilitation programme in which, very commendably, the Union Ministry of Education is taking interest. They are going to formulate their schemes very soon. In all such rehabilitation work proper gradation of the deaf and their individual chances of successful improvement by various types of education they are going to have, should be assessed with great caution. The chances of rehabilitation of a child who may sufficiently improve, as far as his mental and aural non-development is concerned, by a few years of special training, to enter a school with normal children later on, may be overlooked by careless and inaccurate estimation. These children instead of developing into a normal citizen, may suffer throughout their long lives with other unfortunate children who are branded as socially degraded human beings. For proper rehabilitation of the deaf several such well equipped centres of examination and assessment should be opened by the Ministry of Education in all big cities of India with a population of at least four to five lakhs.

In any comprehensive scheme for proper aural rehabilitation co-operation of social workers and workers on the allied field is essential. As the field of activity will be mostly amongst children, social workers on this field should also have some knowledge of nursing children, sick or healthy. A proper and regular training centre for such workers should be opened in at least three or four big cities in India where uniform and standard course of training will be imparted. It should not be forgotten that to attract genuine and willing workers the terms of appointment should be made sufficiently attractive so that a good percentage of these field workers will eventually make a career of this subject thus ensuring a regular supply of experienced workers.

The preventive side of the problem should be the main front where attack should begin. Health workers should be specially instructed to take adequate measures to improve the general health of children. Epidemics of diseases such as measles, influenza, tonsillitis and adenoiditis of various origin, small-pox and other virus diseases which are amongst the many infective conditions of the upper respiratory tract which are responsible for deafness in a child should be guarded against. Venereal diseases amongst prospective mothers should be ruthlessly tackled. If necessary, suitable legislation may be passed by each State putting a ban on the marriage of a man with active venereal disease. One cannot overemphasise the fact that in all these ambitious projects, nutrition plays an all-important role. The general nutritional level of the children should be raised much above the present level.

Consanguinity of marriage should be prevented, if not by legislation, but through propaganda by social workers and religious or semi-religious institutions. As in these matters religious sanction has more lasting effect on average population most of the work should be done in co-operation with such bodies who will carry on this work amongst their respective communities. Congenitally deaf and mute people should be prevented from matrimonial alliance, or at least should be discouraged to have children.

Lastly, all the pediatric hospitals present in this country, and many more of such hospitals which should be opened in all parts of the country including district towns, should be provided with a properly equipped ear, nose and throat department, and adequately staffed by specialists under a senior ear, nose and throat surgeon.

Doctor Amesur, our indefatigable ex-President of last year's conference has been impressing upon the Union Government the urgent necessity of giving some financial relief to the poor people of this country in the matter of purchasing

hearing aids and other allied accessories. Inspite of lack of response from the Government he very ably and strongly put up a plea for the abolition of custom duty and sales tax on the imported hearing aids and the essential electro-accoustical instruments. I should like to impress upon and urge our Finance Minister to take a humanitarian view of the problem and extend his helping hand in this matter, as the estimated loss of revenue on this account will be negligible in comparison with the amount of benefit the nation as a whole will derive.

Side by side, the Government should start manufacturing such aids and equipment in their own well-equipped factories. Even if it is not possible to manufacture all necessary parts in this country at the present moment it would be a great step forward towards the ultimate goal.

Lastly, before I conclude I must say a few words about the colossal problem of cancer cure and cancer research. We are always willing to lend our co-operative hand towards the solution of this large problem which is of world wide interest; but without governmental aid very little can be done. Quite contrary to observations by the western workers, we in India find the incidence of malignant disease of the region concerned within our speciality in comparison with its incidence in other parts of the body, proportionately higher. Laryngeal carcinomas, as all available statistics in this country show, are alarmingly common in comparison with those of other parts of the body, excepting perhaps those of breast, uterus and alimentary system. Until quite recently the whole of this sub-continent had one or two inadequately equipped centres for treatment. Recently however, extended efforts are being made mainly by voluntary workers with the help of some generous people and periodical help from the Government. Considering the gigantic nature of the task such help from the Government has been quite inadequate. More up-to-date well-equipped centres of cancer treatment and cancer research should be opened without further delay."

ALL-INDIA OBSTETRIC AND GYNAECOLOGICAL CONGRESS

The 7th All-India Obstetric and Gynæcological Congress was held in Calcutta on December 22-24, 1952. Dr. (Miss) H. M. Lazarus of Vellore presided. The Congress was inaugurated by Dr. B. C. Roy, the Chief Minister of West Bengal and Dr. H. C. Mookerjee the Governor, was the Chief Guest.

Dr. B. C. Roy, in his speech, said that the Congress was confronted with two problems, one affecting the life of a mother and the other of a child.

Believing more in preventive rather than remedial measures, he said that great and sympathetic care should always be taken of expectant mothers. It was necessary not only from the physiological point of view but from other considerations. An expectant mother should be kept free from all worries and anxieties so that a healthy child, uninfected by any environmental evils, might be born to her.

Dr. Mookerjee, the Governor, said that India must devote considerable attention to the problem of child and maternal mortality. Sixty-five to 75 per cent of such mortality was caused by errors of judgment and lack of facilities and proper care. He felt that every possible step should immediately be taken by the Government to provide extensive medical care to the people of the State.

In her presidential address, Dr. H. M. Lazarus said that due to poverty, ignorance, under-nourishment, adulterated food, want of protected water supply and proper drainage, India had a poor standard of health.

India had one doctor for every 6,300, one nurse for every 43,000 and one midwife for every 4,000 persons. According to standards in the U.S.A. and Britain, she should have one doctor for every 2,000 and one nurse for every 500 persons.

She suggested that to give medical help to the villages, medical practitioners who even after 55, the age of retirement, retained health and energy to carry on medical practice, should be re-employed and sent out to villages. With their ripe experience and time at their disposal, they would be able to meet the problems in the villages and plan and work out means to meet them. Their children would have by that time finished their education and been settled in life so the parents would be free from that anxiety. Conscription of young people for rural areas would not only cripple their future but would not meet the need.

Speaking on the functions of the maternity and child welfare centres she said, "The importance of antenatal clinics has taken deep root, for it has been proved that by proper antenatal care mortality has been greatly reduced by decreasing the mortality from toxæmias to a great extent and early recognition of abnormal presentations and positions and taking good care of the mother have saved both mother and child."

While the importance of antenatal clinics had taken deep root, sufficient emphasis, however, was not being laid on postnatal clinics. One of the ways by which these might be popularised was to run infant clinics side by side with antenatal clinics.

The All-India Medical Council had reduced the M.B.B.S. course by six months to 4½ years, but it had laid down that all students, after successfully completing the final year's course, should do one year's internship. It was hoped that students would be posted to the obstetric and gynæcological wards after they had taken their internship in medicine and surgery.

Pleading for proper maintenance of statistical records in hospitals she said that every obstetrician and midwife should see that births were properly registered and deaths reported. There had been instances where births had not been registered, this had been discovered only when certificates were claimed by guardians when their children were ready to enter schools.

Earlier, welcoming the delegates and guests, the Chairman of the Reception Committee, Dr. Subodh Mitra, said that Bengal was passing through a most critical period to-day. Although her crude birth rate was 22 per thousand, her crude death rate was appalling, to the extent of 13 per thousand. "We lose more than 3,000 mothers every year due to child-birth and death takes the heaviest toll from our infants, namely, 126 per thousand", he said. To add to it, seven hundred thousand infants died every year during the first year of their lives. "To speak in plain language", he said, "we are losing young women of Bengal at the rate of 10 per day; thus 10 homes are ruined every day and on an average four times as many motherless orphans are created. This along with countless infant deaths is a great national loss and a national disaster for which not only our Government is responsible but we obstetricians are responsible as well. This national disaster is preventible. Three things are essential to avoid this national calamity, namely, general improvement of health, family planning and efficient maternity service."

NOTES AND NEWS

CARDIOLOGICAL SOCIETY OF INDIA

The annual Conference of the All-India Cardiological Society will be held at the Christian Medical College, Vellore, South India, on the 6th and 7th March, 1953. Particulars are obtainable from the Organizing Secretary, Conference of the All-India Cardiological Society, Christian Medical College and Hospital, Vellore, N. Arcot Dist., S. India, or from the Jt. Hony. Secretary, Cardiological Society of India, 67, Dharamtala Street, Calcutta 13.

ALL-INDIA OPHTHALMOLOGICAL SOCIETY

The fourteenth session of the All-India Ophthalmological Conference will be held at Poona on the 3rd, 4th and 5th March, 1953. The subject for the symposium will be "Ocular Manifestations of Diabetes."

NEUROLOGICAL SOCIETY OF INDIA

The Second Annual Meeting of the Neurological Society of India will be held at Poona, on 28th February, 1st and 2nd March, along with the Annual Conference of the Association of Physicians of India. Medical men, interested in Neurology and allied subjects are entitled to Associate Membership.

BOMBAY MEDICAL COUNCIL

It has been notified for general information that the name of Dr. M. P. Bhatia, Regd. No. 378/RR has been removed from the Bombay Medical Register under sub-section (2) of Section 8 of the Bombay Medical Act, 1912.

UTTAR PRADESH MEDICAL COUNCIL

It has been notified for general information that the name of the following medical practitioner has been erased under section 26 of the Uttar Pradesh Medical Act, III of 1917, by the order of the Uttar Pradesh Medical Council, from the Uttar Pradesh Medical Register on 16-12-52:

Dr. Rameshwar Dayal Gupta, M.B.B.S. (Lucknow, 1942), registered with the U. P. Medical Council under registration certificate No. 4852, dated April 7, 1944.

AMENDMENT IN THE BENGAL DRUGS ACT, 1946

The Drugs Controller, West Bengal, notifies that in exercise of the powers conferred by Section 33 of the Drugs Act, 1940 (XXIII of 1940), the Governor is pleased to make the following further amendment in the Bengal Drugs Rules, 1946:

AMENDMENT

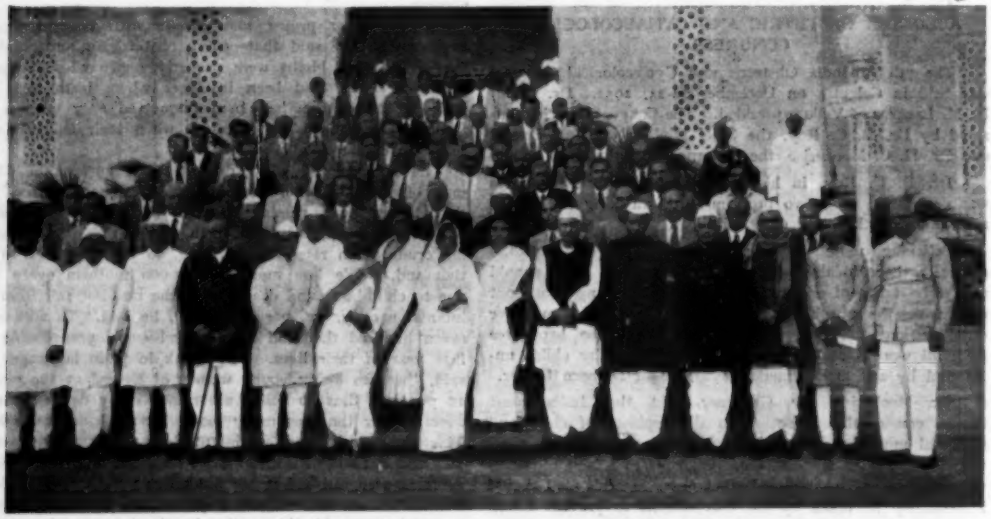
In the said rules—(*a*) In rule 8 after clause (*a*) insert the following clause, namely:—

"(*a a*) holds the pharmaceutical chemists diploma granted by the Pharmaceutical Society of Britain or"

(*b*) In rule 65 *add* the words "or to alter or affect the structure of the human body" at the end.

CENTRAL HEALTH COUNCIL

The first meeting of the Central Health Council was held at Hyderabad on January 29, 1953. Besides the Health Ministers of the States, Mrs. Durgabai Deshmukh member in charge of Social Services in the Planning Commission, Dr. T. Lakshminarain, Health Panel Adviser, Planning Commission, Dr. Chellappa of WHO, Dr. T. C. Davies of UNICEF and Dr. R. B. Watson of Rockefeller Foundation attended the meeting. Rajkumari Amrit Kaur, who is the Chairman of the Council, inaugurated the meeting. In course of her speech she said, "The health of a nation in particular of its children and youth is its most priceless asset. There must be before us who work for this great cause, nothing but the ideal of selfless and devoted service. It is not desirable to wait for big projects to fructify before health and education of the people were attended to. Health and education are nation building activities without due attention to which no real progress could be expected."



RAJKUMARI AMRIT KAUR (FRONT ROW, CENTRE), CHAIRMAN OF THE CENTRAL HEALTH COUNCIL WITH HEALTH MINISTERS OF THE STATES AND OTHER NOTABLES WHO ATTENDED THE HYDERABAD SESSION OF THE COUNCIL ON JANUARY, 29 LAST.

ADVICE ON FOODS OF ANIMAL ORIGIN

Dr. Horace Thornton, Consultant in Food Hygiene to WHO and FAO, has come to India for three months on the request of the Government to advise on the introduction of a modern and scientific approach to the inspection of foods of animal origin, slaughter-house construction and operation, and food-market practices. His terms of reference attach special importance to the questions of primary infection in animals and secondary contamination by man of food products liable to cause food-borne diseases. He may also be asked to give an opinion on existing legislation regulating these questions in various States.

CONTROLLED RESPIRATION FOR BRAIN SURGERY

Anæsthetists of the Royal Melbourne Hospital, Australia, have successfully used automatically controlled respiration for brain surgery.

The equipment, which was made in Australia, was designed to offset the disadvantages of the manual respiratory control hitherto required in conjunction with the increasing use in anæsthesia of such relaxing agents as "tubarine" and "Flaxedil".

In 1950 the new machine was produced, under the prompting of Dr. Norman R. James, Royal Melbourne's Director of Anæsthesia, and was used for several intra-abdominal and chest operations, and frequently for such emergencies as cases of asphyxia due to barbiturate poisoning.

Its success earned it a trial for other types of operations and in October, 1952, it was used for the first time in neurosurgery, for an operation that lasted six hours.

It quickly proved successful, especially in operations requiring surgical attention to those areas of the brain impinging on the vital respiratory centre.

AWARDS OF MEDALS AND FELLOWSHIPS

Coates Medal of the Calcutta University for the years 1950 and 1949 were awarded to the following physicians of the city for their notable contributions to Medical Science—

Dr. R. N. Chaudhuri, M.B., M.R.C.P., T.D.D., F.N.I. (1950)

Dr. P. K. Sen, M.B., M.D., PH.D., T.D.D. .. (1949)

The endowment for the medal was made in 1899 by the Honorary Secretary, Coates Memorial Fund. Originally the endowment was for the award of a prize for Oriental Research in Medicine. Subsequently the terms of the endowment were modified and according to the revised rules a medal to be called 'Coates Medal' is awarded instead of the prize, to a graduate in Medicine of the Calcutta University who is adjudged to have made the most notable contributions to Medical Science during the previous seven years. For this purpose a Board of Adjudicators is appointed by the Faculty of Medicine of the University on whose recommendation the medal is awarded by the Syndicate.

The first recipient of the prize was Rai Bahadur Chunilal Bose, M.B., F.C.S., in 1901 and the first recipient of the medal under the revised terms was Rai Bahadur Sir Upendranath Brahmachari, KT., M.A., M.D., PH.D., F.A.S. in 1928.

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The Division of International Health, U. S. A. Government on the recommendation of the Government of India selected Dr. S. P. De, Bacteriologist, Central Drugs Laboratory, Calcutta, as a T. C. A. Fellow (Point Four Programme). The Fellowship will offer Dr. De opportunities to acquaint himself with the latest methods of Drugs Standardization and Control. Dr. De who has proceeded to U. S. A. intends to visit Europe and Great Britain on his way back and study the administration methods of Drug Control practised in these countries also.

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Four Indian workers in different branches of anti-tuberculosis service left for Copenhagen (Denmark) about the middle of February for advanced study in their specialities under Fellowships awarded by the WHO.

Three of the four were till recently attached to the New Delhi Tuberculosis Centre. They are Dr. S. P. Pamra, who will study clinical aspects of tuberculosis, Dr. R. Narasimhan whose fellowship is in the bacteriology of tuberculosis, and Mr. Albert Laverne who will take a course in tuberculosis home visiting. The fourth member of the group is Dr. T. M. George who had been working at the Tuberculosis Training and Demonstration Centre in Trivandrum. At Copenhagen Dr. George will study the epidemiology of tuberculosis, followed by a month's complementary course in London.

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The American Society for the Study of Sterility announces the opening of the 1953 contest for the most outstanding contribution to the subject of infertility and sterility. The winner will receive a cash award of one thousand dollars, and the essay will appear on the programme of the 1953 meeting of the Society.

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The Raptakos Medical Research Board Fellowships for the year 1953 have been awarded to the following candidates for research work in subjects mentioned against their respective names:

1. Mr. D. V. Rege, University Department of Chemical Technology, Bombay—Role of Folic acid and vitamin B_{12} in nucleic acid metabolism.

2. Mr. M. Bhimasena Rao, Indian Dairy Research Institute, Bangalore—Milk diets in relation to Infantile Cirrhosis.

3. Mrs. Shanta Savur Srinivas Rao, Haffkine Institute, Parel, Bombay 12—Isolation and the study of biological properties of the therapeutically important constituents of the Cobra and Russell's Viper venom.

4. Dr. Shyam Kumar Vaish, Indian Veterinary Research Institute, Izatnagar—Diet and its relation to Blood Tissues Electrolytes.

CORRESPONDENCE

The Editor is not responsible for any views expressed by the contributors

HÆMOLYTIC DISEASE OF THE NEWBORN

SIR,—In your May issue (1952) Dr. Tara Chand, M.B.B.S., referred to a case "Hæmolytic Disease of the Newborn" having kernicterus and mental retardation (child about 2 years old).

Kernicterus is an acute condition of early postnatal life occurring in infants with erythroblastosis fœtalis. Exchange

transfusion with RH negative blood from female donors preferably two transfusions within 24 hours eliminate this complication of kernicterus in a large proportion of live born infants. Surviving children with kernicterus show signs of brain damage which is a problem to the pediatricians.

Few children who survive are usually mentally retarded and there is no known treatment so far. The mother of the child should be watched during subsequent pregnancies for the above complication and early treatment.

For the child about 2 years under reference 'Hope' is the watchword. I am, etc.

Dhantoli (Nagpur), G. K. GAN, M.B.

DOSAGE OF TESTOSTERONE PROPIONATE

SIR,—Usually testosterone propionate is available in the market in strength of 25 mgm. per c.c., but many a time the dose is to be increased to 50 or 100 mgm. per injection to achieve the desired effect.

A case of male climacteric in a middleaged man consulted me for symptoms of tiredness on least exertion, irritability and melancholia, insomnia and failing power in potency (sexual).

The patient had 10 bi-weekly injections of 1 cc. of testosterone propionate containing 25 mgm. per c.c. but to no effect. He was given 1 c.c. of 100 mgm. per c.c. and three more injectons after 4 days' interval. After the 3rd injection the patient was a changed man. The physical and mental vigour was restored. The emotional equilibrium was correcting up. The insomnia disappeared and there was increased dynamic, static and muscular performance. He was further given 10 weekly injections of 25 mgm. per c.c. The patient was very happy and reported that his conjugal relations were more secure than ever before.

Another case of functional uterine bleeding in a young unmarried girl of 18 who had 6 injections of testosterone propionate 25 mgm. per c.c. every alternate day to no effect, responded well to a dosage of 50 mgm. per c.c. every other day, the bleeding being completely controlled on the 5th day.

I have seen that many a time, a higher dose of testosterone propionate gives better results, but the excessive dose should be used judiciously. In younger individuals it might induce priapism and in the female if the dose exceeds 300 mgm. per month it may produce growth of facial hair, deepening of voice, enlargement of the clitoris, etc. I am, etc.

Batala, Punjab (I). V. N. S. BHALLA.

REVIEWS

COWDRY'S PROBLEMS OF AGEING—3rd Edition 1952. Edited by A. I. Lansing. pp. 1061. Williams and Wilkins & Company, Baltimore. Price $15.00.

Since publication of the first edition of this book in 1939 under the editorship of E. V. Cowdry, this book has been considered as an important contribution on gerontology. The book has been as inspiring and informative as the companion volume "Problems of arteriosclerosis" by the same editor (1933).

The present edition continues to serve its purpose. Dr. Lansing, the new editor, deserves congratulations for bringing to bear on the problems of ageing the viewpoints and experiences of forty-eight well known contributors, each studying the subject in his own special field of work. Gerontology has developed into a discipline during the last few decades and its importance is widely recognised, from many points of view: medical, industrial and public health, sociological, biological and psychological.

The present contribution is an excellent one, well worth the study of all those interested in life and life-span. The book is divided into three sections: the first part deals with biological and cellular problems of ageing; the second with clinical and organic problems of ageing; and the third contains discussion on social and economic problems of ageing.

All the different chapters in the different sections have been very ably written in a clear, lucid and succinct style. Production is good barring a few mistakes in spelling.

In India, the scourge of infection, and malnutrition take a heavy toll of lives of youngsters and compared to the advanced countries of the West relatively few people reach the happy old age. Naturally, the problems of infection and malnutrition overshadow those of geriatrics. However with the wider and more successful application of newer knowledge in medicine and in preventive medicine in this country and with improvement of general welfare, the health of the nation is expected to improve in the near future and many more people will reach and live the old age than at present. Gerontology of necessity has to be kept going as a live subject for this purpose and the present book will do immense service in this respect. We sincerely recommend the book to all practitioners and caretakers of health.

BRITISH MEDICAL BULLETIN—Vol. 8. No. 4. 1952. Oxford University Press. Price 12 s. 6 d.

This volume contains many useful articles on cardiovascular research and should be possessed by all who want to keep themselves abreast of the recent trends in the diagnosis and treatment of cardiovascular diseases.

Among the contributors are many notable personalities: John McMichael, G. W. Pickering, W. D. M. Paton, E. P. Sharpey Schafer, E. G. L. Bywaters, Paul Wood, J. F. Goodwin, Sir James Learmouth, Clifford Wilson, John Shillingford, G. S. Dawes, Aubrey Leatham, R. I. S. Bayliss, H. E. Holling, Henry Barcroft and A. J. Slesser. As expected the contributions are sound, comprehensive and highly instructive. A perusal of what is being done in cardiovascular studies abroad should serve to stimulate cardiovascular research in this country.

The second part of this volume contains a short readable commentary on Sir Charles Sherrington the well-known neurophysiologist.

SUPPLEMENT

Journal of the Indian Medical Association

VOL. XXII. No. 6 CALCUTTA MARCH, 1953

XXII PUNJAB STATE MEDICAL CONFERENCE, AMRITSAR

The 22nd Punjab State Medical Conference held under the auspices of the Indian Medical Association, opened its sessions on the 6th December, 1952. The sessions followed on to the next day. Dr. Faqir Chand Shori presided.

Dr. Shori in his presidential address discussed some of the important and urgent problems confronting the medical profession and the people of our country in the present days. Excerpts from his speech are given below:

"The final shape of State Employees Health Insurance Scheme has been before the people in the areas where it is to be enforced. The scheme is intended to benefit industrial workers and the pivot of the plan is evidently the participating doctor. Commonsense will indicate that the health insurance medical officer ought to be ensured a fair deal if the plan is to work successfully. But I regret to observe that the officials who are in charge of the execution of the scheme have ignored this basic consideration. They want the doctor to accept Rs. 5/- per worker per year and yet expect him to run a clinic, supply medicine and equipment free and at the same time attend patients at home.

In 1944 Professor Adarkar of Bombay calculated that the total cost of medical benefit expenditure will come to minimum of Rs. 9/- per insured employee. He detailed this sum thus:—

1.	Medical Attendance: Capitation Fee of Insurance Doctor	Rs. 6/12/-
2.	Cost of maintenance of clinics, etc. ...	,, -/14/6
3.	Drugs and appliances	,, 1/5/6

Drugs under item 3 above only include the usual drugs prescribed by general practitioners. The cost of expensive drugs antibiotics injections and expensive appliances like splints, etc., will be paid by the Govt.

This figure has reference to the cost of living index prevailing in 1944 but prices have gone much higher since that year. Even if we calculate on the basis of 1/3 increase which in fact is nearer 50 per cent the proper capitation fee for the doctor will be Rs. 12/- per year per worker. In our own way we have tried to impress on the Government the absolute unworkability of the present figure. I repeat the warning from this platform. No doctor should come forward on an offer of Rs. 5/-. The least the Government can do is to raise the figure to Rs. 9/- and also give to the participating doctor an annuity as is provided for in the British Health Insurance Act. An insurance doctor there gets £300/- in addition to his capitation fee. This comes to about Rs. 300/- per month. We shall not grumble if this amount is reduced and a doctor is given an annuity of say Rs. 2,000/- for 2,000 workers. I do hope that the Corporation will listen to the counsel of the I. M. A. in this matter.

The final draft of the 5 Years Plan will be out during the next few days and it will become clear how the Planning Commission envisage, among other things, health services in the country to develop during the next 5 years. So long as the draft is not published it is not possible to anticipate its final proposals. I cannot do better than quote a significant sentence from the Association's recommendations "The object of planning should be not merely to cure disease but to prevent it by creating such living conditions as would make the incidence of illness rare". The final plan will be judged according as it is able to achieve this objective. So far as the Punjab is concerned, its own plan will have to be linked and integrated with that evolved by the Centre so that our State advances side by side with the rest of the country.

DR. FAQIR CHAND SHORI
THE PRESIDENT OF THE CONFERENCE

I now come to another important point, which is the static nature of the medical profession in this country. It is said that barring a few, the generality of teachers and practitioners are all busy in making money and that nobody seems to worry about the profession itself and the need to take it forward. Little defence can be found for the indifference shown to research by the highly paid teachers in medical colleges. The leadership of the profession by virtue of their knowledge and attainments belongs to them. But it has been noted with regret that awareness of the responsibilities that go with this high position is generally absent. Traditions of research have not developed in the teaching institutions. The preoccupation of the professors and their assistants is in the direction of money. That is why an insistent demand has been made, of late, that private practice be banned in toto for members of the teaching faculty. The recent attempts of some of the governments to stop private practice has not been successful. State governments should carefully consider the steps they should take to stimulate teachers' interest in medical research. The stopping of private practice may be an essential step but it will have to be complemented with others equally necessary for the realisation of the same. Scales of salary will have to be made more attractive and conditions

of service more tempting. Simultaneously medical colleges should be adequately equipped and other facilities provided. In this connection if for various reasons the government cannot stop the private practice all at once of the present incumbents, it should be carried out at least in stages.

Complaints are frequently made in the press about the conditions of government hospitals. Correspondents allege that many of the hospitals are not rendering adequate service to the public. There are several reasons for the deteriorating standard of State hospital utility. The personnel employed are poorly paid with the result that the attention of most of them is fixed on how to supplement their income. Another serious drawback is that government spend miserably low amounts on providing medicines and other equipments in these hospitals. The result is that cases go inadequately treated. Since hospitals and the manner in which they are run lead to popular discontent, the blame gets ultimately transferred to the profession as a whole. The man in the street begins to call the general adequacy of the modern system of medicine into question and to condemn wholesale all doctors whether in private practice or in government employment. Something must be done to mend this state of affairs. As I have said above, members of the profession should develop a better sense of responsibility. They should realize that whereas Medicine is a profession in the sense that it enables them to earn a living it is also a mission because no doctor has the right to live for himself. He is there to spread health and happiness around him and in proportion to the success attained in doing so he will be justifying the choice by him of medicine as a career. Let me hope that we shall develop more and more of this zeal to serve the public and the country. As time passes the complaint that we now hear so frequently about the mercenary spirit of some practitioners will disappear.

The village medical relief is a perennial theme. But notwithstanding the frequency with which it is discussed it is nowhere near proper solution. Our rural population continues to be treated mostly by quacks. The reason is that there are a few rural State dispensaries and the less said about the quantity and quality of medicines stocked therein the better. In common with government employment policy in other spheres of public health the village doctor is mostly inadequately paid and no attention is paid to his other requirements. That is why the scheme to persuade young practitioners to settle in villages has failed. While I have praise for government's zeal I have few compliments to pay to its intelligence. When it is not prepared to take the basic needs and requirements of an educated man and his family into consideration how can it hope to succeed in dumping him in the country side? He has his family to look after, his children to educate and his own needs of a decent cultural life to cater to. So long these basic factors are ignored the Indian villages will remain neglected and the problem of rural medical relief will remain acute.

While it is hoped that the Government will do its own duty towards the village medical relief, I have a suggestion to make in this connection to practitioners. It pertains to both town and village practice. I propose that the doctors should combine to start poly-clinics in towns with branches established in groups of villages in the neighbourhood. Polyclinics will enable practitioners to enlarge the sphere of their practice and to make it more effective. They will be able to serve patients better and more economically and at the same time ensure a reasonable living for the promoters. The sphere of activity can with advantage be extended to the country side. Doctors can go to the village branches by turns and thus keep in contact with both urban and rural patients. I hope that this suggestion will be given proper consideration and made practical by the formation of regular and detailed schemes. I am of the view that provided proper men are forthcoming, polyclinics have a promising future in this country.

I would put a word for better medical education in our country and reiterate I. M. A.'s demands for one standard of medical education. The fear that there would be shortage of medical men can be overcome by instituting double shift system of education in the existing institutions. The resources and equipment available should be exploited to the fullest extent. Of course, hospitals will have to be enlarged to provide for the extra clinical material needed. The professorial appointments to such teaching institutions be made on an all-India basis by an open competitive selection.

I will be going off the track if I do not impress with all the emphasis at my command that the medical examination of school children should be developed on the more scientific lines so that the money paid by the students to this fund is repaid in the shape of effective medical examination and there is no reason why the school authorities should feel satisfied by the perfunctory examination of school children as at present. The absence of play ground facilities in our schools and colleges cannot but be deplored and need for these too is strongly stressed so that our students may develop sound minds and healthy bodies and become useful citizens of our country.

Let me appeal once again to every medical man and woman wherever he or she may be to join the Indian Medical Association and make it strong on the home front so that it could effectively discharge its responsibilities as a national organisation.

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RESOLUTIONS PASSED AT THE CONFERENCE

1. In the interest of medical education and research this conference recommends that the cadre of teaching staff of Medical College be separated from the general cadre of P. C. M. S. and all appointments to this cadre be made only on merit.

2. This conference recommends that the compulsory training in First Aid be introduced in all colleges and in high classes of all schools in the State both for boys and girls and that Home Nursing also should be a compulsory subject for girl students in these classes.

3. In the interest of ailing public, medical education, and research, this conference recommends that all Government Medical Officers whether in teaching institutions, or Tehsil and District Headquarters hospitals be debarred from private practice and that their scale of pay be fixed as follows:

I. Professors—Pay and Status of a Judge of High Court.

II. Asstt. Professors, Specialists and Civil Surgeons—P. C. S. Class I plus 25 per cent.

III. Asstt. Surgeons P. C. M. S. Gazetted (Class II)—P. C. S. class II plus 25 per cent.

IV. Asst. Surgeon Class II (Non-Gazetted)—Rs. 200—500. 25 per cent increase is recommended in view of the arduous nature of the duties of Medical Officers.

4. Resolved that a central cadre be created for the professorial appointments in all medical colleges in India including the All-India Medical Institute Delhi to enable recruitment to the appointment from the talent available.

5. Resolved that I. M. A. Central be requested to make arrangements for post-graduate studies in various medical colleges in the country for medical graduates of the State universities.

6. Resolved that this conference reiterates resolution No. 7, 4 and 8 passed in the Punjab Provincial Medical Conference held at Jullundur on 17th and 18th November, 1951.

7. The conference recommends to the government to exempt Registered Medical Practitioners who dispense medicines to their own patients only, from the purview of Sales Tax Act.

8. With a view to make available expert advice on health matters this conference recommends that I.M.A. nominees be taken as Associate members on Health and Sanitation Committees of various local bodies.

9. This Conference urges on the government to associate nominees of I.M.A. to Provincial and District Tuberculosis Associations and School Children League of Health and as non-official visitors to hospitals, jails and mental hospitals.

10. To enable the Medical Officer of Health to arrive at correct and prompt diagnosis of notifiable diseases, this Conference recommends that the services of pathological laboratories at various District Headquarters hospitals be made available to them.

11. In order to check the spread of communicable diseases, this conference recommends that the government should issue directive to all municipal committees and local bodies in the State to prohibit the growing on sewage of all such vegetables that are taken raw.

12. This conference recommends that the government should see that every school in the State is provided with facilities so that clean and wholesome mid-day meal be made available for children on non-profitable basis and that the sale of eatables by hawkers near the school premises be strictly prohibited.

13. With a view to ensure better working of rural dispensaries this conference is of the opinion that the service of rural medical officers be merged into provincial service and that every government medical officer be made to serve in rural area for at least 3 years.

14. This conference views with concern the fatal cases of poisoning amongst children caused by fire-works containing phosphorus, etc., and urges upon the government to stop the import, manufacture or sale of such fire-works.

15. While reiterating the resolution No. 11 passed at the Punjab Provincial Conference at Ludhiana in 1950 this conference urges upon the government to enact without any further delay the Punjab Public Health Bill which was circulated for inviting public opinion about 2 years ago.

16. This conference commends to the private medical practitioner settled in towns to group themselves into polyclinics and have branches of the same in adjoining villages to afford medical relief to the rural areas.

17. With a view to improve social medicine in rural areas, this conference resolves that the I.M.A. Punjab through its various district and local branches should undertake, as it is doing in towns, the propagation of health education among the villagers and to guide and help them to improve their environmental hygiene particularly the water supply, drainage, filling up depressions, cleaning of houses and streets and the disposal of refuse, etc., and further resolves that the government be approached to provide facilities in the form of conveyance, printing of posters pamphlets and charts on health subjects and the supply of lantern slides and films for visual education.

18. Resolved that the branches of the I.M.A. be directed to enforce strictly healthy ethical rules for the registered medical practitioners on their members. To attain this objective the following should be carried out:—

(i) Every member should hang a name board according to the size and pattern to be designed and patented by the provincial association.

(ii) No other board or advertisement be exhibited in the clinic.

(iii) The members should not style themselves as "Chemists & Druggists", or XY & Sons or AB Pharmacy, or Medical Hall or anything like this.

(iv) The dispensary attached to the clinic be utilised for the prescriptions of their own patients only.

(v) The provisions of the Drug Act should be strictly followed.

19. This conference considers the Panel System of Labour Health Insurance Scheme as the only feasible system to give medical benefit to the labour, but considers the capitation fee offered to the Panel Doctor as totally inadequate. It urges on the Corporation that in order to get the best work out of the medical officers for the scheme, they should be adequately remunerated. It disapproves the attitude of the Corporation in bypassing the I.M.A. and approaching the medical profession individually, thus trying to undermine the solidarity of the I.M.A. the only national organisation of the province. It requests the medical profession to stand solidly behind this organisation in respect of the stand taken by it in the matter.

Your Health
For *you* and *your patients*

BRANCH NOTES

AMBALA BRANCH—The annual function of the branch was held on the 29th and 30th of November, 1952. Dr. Partap Singh spoke on Urticaria; Dr. Devi Chand on Some Aspects of Heart Disease; Dr. Sethnan on Pleurisy with Effusion; Dr. D. B. Mukerji on Transverse Myelities and Dr. B. L. Kapur on Sterility in Women. Office bearers for 1952-53 were elected with Dr. A. M. Deva as president and Dr. R. N. Sareen as secretary. The annual report of the last year shows that 5 clinical meetings besides one symposium on Enteric Infection were held.

ASSAM PROVINCIAL BRANCH—A meeting of the Working Committee of the branch was held on 21-9-52 with Dr. B. Barooah in the chair. Eight members were present. The circular of the General Secretary, I. M. A., regarding the T. B. Seal sale campaign was approved. A sub-committee was formed to submit a scheme for selection of doctors for appointment as Hony. Medical Officers in Civil Hospitals for approval in the Working Committee meeting. The resolutions of the 28th A.-I. M. Conference were considered. The report of the Anti-spurious drugs was considered and approved.

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In the adjourned meeting of the Working Committee held on 22-9-52, a resolution was passed requesting the Government of Assam to withdraw the ban on the staff of the Assam Medical College, prohibiting them to hold office in the I. M. A. for 5 years. The resolutions of the various branches sent for discussion were considered.

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An emergent meeting of the Working Committee of the branch was held on 22-12-52 with Dr. B. Barooah in the chair. The invitation of the Nowgong branch to hold the 4th Assam Provincial medical conference was accepted. Dr. P. N. Ghosh was declared elected as president of the conference.

BANARAS BRANCH—The annual report of the branch shows that four general, four scientific and three extraordinary meetings were held during the year. There were three social gatherings also. Office-bearers for 1952-53 include Dr. S. N. Mukherji as president and Dr. L. R. Mehta and Dr. K. P. Teware as secretaries.

BANGALORE BRANCH—A meeting of the branch was held on 14-11-52 with Dr. C. V. Natarajan in the chair. Dr. V. N. Krishnamurthy gave an interesting talk on "Egg-Culture and other methods of Virus Studies". He then demonstrated Hæmaglutination and its significance in immunological work and also the possibility of a compliment fixation test in virus diseases.

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A tea party was given on 12-12-52 to delegates of the All-India Conference of Industrial Medicine. About 50 delegates and 60 members of the branch were present. It was a happy function in which lively discussion was also held on the subject of Industrial Medicine.

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A clinical meeting of the branch was held on 17-12-52. Dr. C. V. Natarajan presided. Forty members were present. Dr. Oscar Ewing, the Director of Federal Security Agency of U. S. A., spoke on "General Social Welfare" which was highly appreciated by the members.

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A clinical meeting was held on 23-12-52. Dr. B. K. Narayana Rao was in the chair. Forty members were present. Dr. M. V. Govindaswamy spoke on "Cultural Psychiatry".

BHOWALI BRANCH—The annual report of the branch for 1951-52 shows that 9 meetings were held and three papers were read during the year. Seven cases were also demonstrated. In the annual general meeting of the branch which was held on 4-10-52 and attended by 12 members, Dr. Mrs. E. Khazan Chand was elected the president for the year 1952-53 and Dr. B. C. Arora, the secretary.

CACHAR BRANCH—A meeting of the branch was held on 29-11-52. Dr. S. C. Gupta was in the chair. Dr. S. K. Datta (Jr.) read a paper on "Public Health".

CHAIBASSA BRANCH—A meeting of the branch was held on 30-8-52. Fifteen members were present. Dr. S. C. Sarkar read a paper on pregnancy with its complication.

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A meeting of the branch was held on 5-10-52 with Dr. D. N. Roy in the chair. Seventeen members were present. Dr. S. P. Mookherji read a paper on "Blood Report—M. P. not seen."

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Another meeting of the branch was held on 16-11-52 with Dr. D. N. Roy in the chair. Seventeen members were present.

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Death is announced of Dr. Nalini Ranjan Bakshi, a member of the branch, on 27-11-52.

CHAPRA BRANCH—The annual meeting of the branch was held on 21-11-52. Office-bearers for 1952-53 were elected with Dr. Akhomy B. P. Sinha as president and Dr. L. P. Verma as secretary. In the year 1951-52, 7 meetings were held and scientific papers were read in some of the meetings.

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A special meeting of the branch was held on 18-12-52 and a condolence resolution was passed on the death of Dr. G. K. Ghosh, Principal, Darbhanga Medical College.

CHETTINAD BRANCH—A meeting of the branch was held on 30-11-52 with Dr. D. O. Sendel in the chair. Details of work of a blind relief team of 4 doctors in Trichy district under the auspices of the Red Cross were given by Dr. T. S. Shetty. Interesting statistics were given regarding the incidence of the various eye diseases. Dr. Sendel suggested that the Government should come forward and assist the blind relief scheme in the districts.

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A meeting of the branch was held on 20-12-52. Dr. S. Subramaniam presided. Dr. J. S. Sundar Raj gave an interesting talk on "Talipes Equino Varus". Next Dr. J. K. Kurian read a short paper on "Retro-bulbar Cysts with Special Reference to Ecchinoccal infestation."

CHINGLEPUT DISTRICT BRANCH—A meeting of the general body of the branch was held on 30-11-52. Dr. P. S. Sreenivasan was in the chair. The members condoled the death of Dr. C. V. Ekambara Mudaliar. The accounts for the year 1952-53 were elected with Dr. P. S. Sreenivasan as president and Dr. R. Varadarajan as secretary. In the ordinary meeting that followed, Dr. S. R. Bhat read a paper on "Dental Diseases as a source of Focal Sepsis".

COIMBATORE BRANCH—A meeting of the branch was held in conjunction with the Society for the Study of Industrial Medicine, Madras on 14-11-52 with Dr. I. Pitchai in the chair. Seventy members were present.

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A meeting of the association was held on 3-1-53 with Dr. Pitchai in the chair. At the outset, the members recorded a deep sense of sorrow at the sudden death of Dr. T. Sadagopal. Then a clinical demonstration of a number of heart cases, abdomenal tumours and rare fractures was held.

DHANBAD SUB-DIVISIONAL BRANCH—The annual general meeting of the branch was held on 18-1-53. More than 100 members were present. The annual report and the audited account were passed. Dr. A. N. Ghatak was elected the president and Dr. R. Mukherji the Secretary for the year 1952-53. The membership during the year increased from 66 to 115. Six general meetings and 3 executive committee meetings were held during the year.

DHUBRI BRANCH—A meeting of the branch was held on 29-11-52 to congratulate Dr. A. D. Mukharji, the Editor of the Journal of I. M. A. for representing the cause of the Association in the Conference of the WHO.

EAST GODAVARI BRANCH—A meeting of the branch was held on 29-11-52 with Dr. S. Krishnarao in the chair. A symposium of Prolapse of Uterus was initiated by Dr. (Mrs.) M. S. Naidu. Dr. Jogarao and Dr. V. Venkataraju participated in it. Dr. Anandarao showed radiogram of an inverted stomach and dextrocardia. Dr. N. Ammanna spoke as to how the rays are useful in leucoderma. Dr. Narasimhamurthy demonstrated a case of liver abscess and a case of multi-vitamin deficiency, Dr. Veerabhadrarao, a case of Paraplegia of lower extremities, Dr. Gurudattarao, a case of tumour of the left testicles, Dr. Rammohanrao, a case of dislocation of Patella.

ERODE MEDICAL ASSOCIATION—A meeting of the association was held on 29-11-52 with Dr. S. Balasubramanian in the chair. Dr. R. Kalamegham spoke on "Prognostic value of the Schilling Count" and Major P. G. K. Menon delivered a lecture on "Sinus Infection met with in general practice". Thirty-five doctors were present.

FEROZEPORE BRANCH—A meeting of the branch was held on 4-11-52 with Dr. Raja Ram Bhola in the chair. Thirteen members were present. Dr. Harnam Singh spoke on Ultra Violet rays.

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Another meeting of the branch was held on 2-12-52 with Dr. Raja Ram Bhola in the chair. Nineteen members were present. Dr. D. S. Bhalla demonstrated a case of Cardiac Murmer. Another case of Cardiac Failure was demonstrated by Dr. B. N. Bhargava.

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An extraordinary meeting of the branch was arranged on 12-12-52 and on 14-12-52 when films on (1) Principles of Penicillin Therapy (2) Co-arctation of Aorta (3) Solserol (4) Penicillin and streptomycin (5) Penicillin Tablets were shown.

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A meeting of the branch was held on 13-1-53 with Dr. Raja Ram Bhala in the chair. Twenty-two members were present. Dr. O. P. Bandlas read a paper on Sarcoma of the Choroid.

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An extraordinary meeting of the branch was held on 15-1-53. Dr. Ralph Walter Lloyd, president of the Horiville College, Tennesse State and a member of the World Council of Churches addressed the members on the subject, "How an American looks at America from India".

FORBESGANJ BRANCH—A meeting of the branch was held on 11-1-53 with Dr. H. N. Sarbadhikery in the chair. After normal business, Malaria, Typhoid and their modern treatment was discussed.

GARBETA BRANCH—A condolence meeting of the branch was held on 10-12-52 to place on record a deep sense of sorrow at the sad death of Dr. Surjanarain Banerjee, an ex-president of the branch. Dr. K. P. De was in the chair.

GADAG BRANCH—A meeting of the branch was held on 18-11-52 with Dr. V. Chafekar in the chair. Nineteen members were present. Dr. G. V. Joshi spoke on "Acute Abdomen and the general practitioner".

GAUHATI BRANCH—A meeting of the executive committee of the branch was held on 27-4-52. Dr. K. C. Borooah was in the chair. Nine members were present. A condolence resolution on the death of Dr. Guruja Kumar Deb was passed. The formation of a cultural medical club was discussed at length.

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A meeting of the executive committee of the branch was held on 26-8-52 with Dr. K. C. Borooah in the chair. Eight members were present. Dr. Birinchi Kumar Borooah enlightened the house about the progress of the construction and

VI GUJARAT & SAURASHTRA PROVINCIAL MEDICAL CONFERENCE

The sixth Gujarat and Saurashtra Provincial Medical Conference will be held at Baroda on the 14th, 15th and 16th March 1953 under the presidentship of Major C. P. Bhatt of Bhavnagar.

fund of the club. A construction committee was formed in the meeting.

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A meeting of the branch was held on 30-8-52 with Dr. K. C. Borooah in the chair. Twenty-three members were present. A Sub-Committee was formed to raise a fund for the proposed medical club at Gauhati.

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The annual meeting of the branch was held on 13-12-52 with Dr. K. C. Barooah in the chair. Twenty-one members were present. The annual report was presented and it showed that the branch held 3 executive meetings and 2 general meetings and 1 public meeting in which Dr. S. N. Sarma spoke on "Care of Ear, Nose and Throat". Office-bearers were elected with Dr. K. C. Borooah as president and Dr. U. N. Borooah as secretary. One scientific paper on Chemotherapy was read by Dr. D. K. Sen and a case note, by Dr. S. K. Sengupta.

GHATKOPAR BRANCH—The annual report of the branch shows that 3 meetings were held during the year 1951-52. In one of these meetings Dr. Chamallal Mehta of Bombay explained the Employee's State Insurance Scheme. The membership of the branch increased from 23 to 29.

GHUGUDANGA BRANCH—A meeting of the branch was held on 23-1-53 with Dr. Sarat Sashi Sarkar in the chair. Twelve doctors were present. Dr. A. Bhattacharyya, M.B., D.G.O., spoke on "Recapitulation of Obstetrics by general practitioners."

GORAKHPUR BRANCH—The annual report of the branch shows that there is an increase in membership, that seven clinical papers were read during the year and also medical films were exhibited. Nine general meetings, two executive committee meetings and one emergent meeting were held in the year. Dr. S. C. Banerjee has been elected the president and Dr. S. S. Lal, secretary for the year 1952-53.

HASSAN BRANCH—A clinical meeting of the branch was held on 17-1-53 with Dr. Abdul Aleem in the chair. The following clinical subjects were discussed, (1) Diabetic Coma by Dr. D. Shamanna (2) Electrical Burns by Dr. P. C. Bopaiah (3) Treatment of Tetanus by S. V. Subbarao (4) Treatment of Asthma by Dr. H. R. Rangaswamy (5) Chronic Tubercular Sinuses in a case of girl of 8 years demonstrated with Radio-Grams by Dr. H. N. Venkatarangaiah (6) Isosincotinic acid Hydrazide in Pulmonary Tuberculosis by Dr. K. T. A. Iyengar (7) Two cases of Bronchitis simulating Whooping Cough by Dr. Nanjundarao (8) A case of an old woman goaded by a bull with Protrusion of intestines by Dr. B. K. Srirangachar.

JALGAON BRANCH—A meeting of the branch was held on 12-10-52. Dr. D. B. Pendharkar read a paper on "Industrial Medicine of Health of a worker".

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Another meeting of the branch was held on 23-11-52. Dr. S. G. Chitre spoke on "The Treatment of Pulmonary Tuberculosis".

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A meeting of the branch was held on 14-12-52 at Bowdad, 40 miles away from Jalgaon. It was a very enjoyable trip to the members. On 21-12-52, an extraordinary meeting was held to meet the Surgeon General, who gave a talk on The Rural Medical Aid given by the Government of Canada.

JALPAIGURI BRANCH—The annual general meeting of the branch was held on 31-12-52. Twenty-one members attended. Dr. Charu Chandra Sanyal was in the chair. The annual report for 1951-52 with the statement of accounts were adopted. Dr. Abani Dhar Guha Neogi was elected the president and Dr. Sailesh Bhoumic, Secretary for the year 1952-53. The annual report shows that 3 general meetings and 7 working committee meetings were held during the year. A decrease in membership was recorded.

JEHANABAD BRANCH—The annual conference of the branch was held on 21-12-52. Dr. R. K. Prasad presided. Office-bearers for the year 1952-53 were elected with Dr. R. K. Prasad as president and Dr. R. L. Verma as secretary. Each member of the branch was requested at the conference to sell T. B. Seals worth at least Rs. 25/-. The annual report of the branch shows that 7 meetings were held during the year. Membership increased from 11 to 17.

KANPUR BRANCH—The annual meeting of the branch was held on 7-12-52 with Dr. B. N. Bhallay in the chair. One hundred and fifty-one members were present. Office-bearers for the year 1952-53 were elected with Dr. S. N. Misra as president and Dr. Navin Chandra as secretary. The annual report of the branch shows that membership increased by 42 up to the end of September, 1952. Since then 15 more members have been added. There were 4 ordinary meetings and 12 clinical meetings held during the year. Also nine executive meetings were held. In the clinical meetings Dr. R. N. Misra spoke on Diseases of the Ear, Nose and Throat; Dr. D. N. Sanyal on "Control of Tuberculosis in Europe"; Dr. S. S. Misra on Chronic Dysentery and Diarrhœa; Dr. S. K. Roy Chowdhary on Pharmaceutical Industry in relation to Medical Men; Dr. Mohan Lall on Keratoplasty and need of public co-operation and common Eye Diseases in India and modern treatment; Dr. B. B. Bhatia on Trend of recent advances in modern medicine; Dr. R. N. Tandon on Trend of recent advances in chemical and surgical treatment of Tuberculosis and Dr. S. P. Gupta on Role of Modern Therapy in Occular diseases.

KANGRA BRANCH—A meeting of Khangra branch, Dharamsala was held on 30-12-52 and office-bearers for the year 1952-53 were elected with Dr. Surat Singh Grewal as president and Dr. M. C. Dewan as secretary.

KARIMNAGAR BRANCH—A meeting of the branch was held on 26-11-52. Dr. N. R. U. Swamy was in the chair. A symposium on pneumonias was discussed. Dr. Jakhruddin Hassan initiated it and Dr. Bhoom Reddi, Dr. Sreenivaschari and Dr. Abbas Ali participated in it. Dr. L. Devana presented a case of Infant of Osteogenesis Imperfecta. Dr. K. W. Ahmed demonstrated a case of irregular Pyrexia of unknown origin. Dr. Gulam Murtaza demonstrated a case of Pleural Effusion and a second one on T. B. Lung. Next Dr. N. R. V. Swami demonstrated a skiagram of a patient of Pulmonary Tuberculosis.

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A meeting of the branch was held on 21-12-52 with Dr. N. R. V. Swami in the chair. Dr. Bhoom Reddi opened a symposium on "Emergencies in Cardio Vascular Diseases" in which Dr. Md. Osman, Dr. Srinivas Chari and Dr. Janardhan Rao participated. Dr. K. Wahiuddin Ahmad presented a case of T. B. Lung with pleural effusion, Dr. Gulam Murtaza, a case of Gumma of Bones and Dr. Janardhan Rao, a case of Myxœdema.

KRISHNA DISTRICT BRANCH—The annual meeting of the branch was held on 25-11-52 with Dr. J. B. Oliver in the chair. There was a demonstration of cases by Dr. Oliver and Dr. Hiscox. Dr. V. V. G. Tilak read a paper on "Rheumatoid Arthritis". During the year 1951-52 six meetings were held and clinical papers were read and discussed. There were 46 members on the roll.

XIII MAHARASHTRA & KARNATAK PROVINCIAL MEDICAL CONFERENCE

The 13th Maharashtra and Karnatak Provincial Medical Conference will be held on 23rd, 24th and 25th of April 1953, at Willingdon College, Sangli.

KHAMGAON BRANCH—A clinical meeting of the branch was held on 4-1-53 with Dr. Parasnis in the chair. Dr. T. S. Row, Civil Surgeon, Buldana, delivered a lecture on "Symptom Complex of Angina Pectoris and Coronary Occlusion and their treatment."

KOLAR GOLD FIELDS BRANCH—A clinical meeting of the branch was held on 22-11-52 with Dr. K. Krishna Rao in the chair. Dr. J. C. Jeffrey demonstrated a case of "Fracture of the Shaft of the tibia and delayed union" with radiograms. A fatal case of "Perforated Mecken's diverticulum in an infant" was also demostrated by him. Dr. G. E. Ffrench took the members round the Pathological Laboratory of the K. G. F. Hospital and explained the various investigations carried out with demonstration of some rare collections of specimens of pathological interest.

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A clinical meeting of the branch was held on 27-12-52 with Dr. B. N. Srinovasa Rao in the chair. Dr. Miss J. Dominick, spoke on "Pain in the abdomen in Women." This was followed by an extraordinary general meeting in which amongst other things, the auditor and Hony. Treasurer to the branch were elected

KOTHAGUDIUM BRANCH—A clinical meeting of the branch was held on 19-12-52 with Dr. T. C. Ramchandani in the chair. Dr. B. Das gave a talk on his first impressions of Kathhagudium. Dr. T. C. Ramchandani showed by figures how malaria and gastro intestinal diseases diminished due to installation of chloronomes and the spraying of D.D.T.

LUCKNOW BRANCH—In the annual general meeting, Dr. R. N. Tandon was elected the president and Dr. M. M. S. Siddhu secretary for the year 1952-53.

MADRAS BRANCH—The annual general meeting of the branch was held on 10-12-52 with Dr. K. Narayanamurthi in the chair. One hundred and eighty-one members were present. After the adoption of the annual report and statement of accounts for 1951-52, office-bearers were elected for 1952-53 with Dr. P. Natesan as president and Dr. N. A. Sankaran and Dr. N. A. Iyengar as secretaries to the branch. Dr. Natesan would be in charge of the office and all matters excepting the clinical and scientific meetings of which Dr. Iyengar would be charge.

MADURAI MEDICAL ASSOCIATION—A meeting of the association was held on 12-12-52, with Dr. M. N. Rajan in the chair. Dr. M. Nataranjan, Orthopædic Surgeon, Stanley Hospital, Madras, gave a lecture on "The need for an orthopædic service".

MANDYA BRANCH—An executive committee meeting of the branch was held on 19-12-52. Dr. K. Sundaresan was in the chair. The usual routine business was gone through.

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A meeting of the branch was held on 28-12-52 with Dr. K. Sundaresan in the chair. Twelve members were present. The normal business was gone through.

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A committee meeting of the branch was held on 12-1-53. Dr. E. Sundaresan was in the chair. The members discussed the introduction of a panel of doctors for students by the Mysore University and were of opinion that as practically all the students of the Mysore University live outside the University residential quarters and as most of the families of the students have family doctors, this panel system cannot be made applicable in such a non-residential university.

MORVI MEDICAL UNION BRANCH—A meeting of the branch was held on 30-11-52, with Dr. D. C. Oza in the chair. Dr. P. D. Raval demonstrated a herb which was analogous to Aureomycin both in appearance and under microscope.

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A meeting of the members of the Morvi Medical Union was held on 4-1-53. Ten members were present. Dr. J. Y. Parekh occupied the chair. Dr. D. G. Dave spoke on Asthma.

MUZAFFARPUR BRANCH—A meeting of the branch was held on 3-12-52. Nine members were present. Delegates to the Patna Conference were elected.

MIDNAPORE BRANCH—A general meeting of the branch was held on 7-1-53 with Dr. B. N. Sinha in the chair. Office-bearers for the year 1952-53 were elected with Dr. A. C. Basu as president and Dr. N. R. Santra as secretary.

MANGALDOI BRANCH—A meeting of the branch was held on 26-12-52. Thirteen doctors were present. Dr. B. Das was in the chair. Office-bearers for the year 1952-53 were formed with Dr. J. N. Chakravorty as president and Dr. R. Saharia as secretary.

MALEGAON BRANCH—A meeting of the branch was held on 14-12-52. All the members were present. The normal business was done.

MALABAR BRANCH—The annual meeting of the branch was held on 4-12-52. Sixty members were present. Dr. C. K. Menon presided. Office-bearers for the year 1952-53 were elected with Dr. C. K. Menon as president and Dr. C. R. Parasuram and Dr. U. B. Krishnan as secretaries. Dr. K. C. Nambiar, the president of the South Indian Provincial Branch inaugurated the meeting with a discussion of various interesting topics of the day.

MADHIPURA BRANCH—In a meeting of the doctors of Madhupura, a branch of I. M. A. was formed on 16-11-52 with Dr. B. D. Ganguly as president and Dr. G. S. Prasad Singh as secretary. It was also decided that on the 1st Saturday of every month, a clinical meeting will be held.

MYSORE MEDICAL ASSOCIATION—A meeting of the branch was held on October 25th, 1952, under the chairmanship of Dr. J. C. Jeffrey, Dr. K. Krishna Rao spoke on "The Problem of Tonsils and Adenoids". Dr. K. S. Nanjundiah read a paper on "Immunity in Malaria" and Dr. P. Channabasappa demonstrated a case of "Childhood Hemiplegia".

The council meeting of the association was held on 9-11-52. Twenty members were present. Dr. T. Chandrasekharaiya presided. Dr. B. R. R. Reddy was declared to be elected the president and Dr. T. K. Dayalu and Dr. V. Kamalamma, the secretaries of the association for 1952-53. The last refresher course was conducted for 14 days and 48 doctors attended the course. It was decided that the refresher course should be made a permanent feature. A sub-committee was formed to go into this question. At the desire of the president, the council resolved to request the Bangalore Branch to arrange for the annual conference there during the first week of February, '53.

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The Working Committee of the association met on 23-11-52 with Dr. M. Shivaram in the chair. It was agreed to hold the conference in Bangalore on 6th, 7th and 8th February, '53.

NOWGONG BRANCH—A meeting of the branch was held on 21-12-52. Twelve members attended and nominated Dr. P. N. Ghosh of Dibrugarh for the presidentship of the ensuing session of the 4th Assam Medical Conference.

PORBANDUR BRANCH—A meeting of the branch was held on 30-11-52 to meet His Highness Namdar Maharana Saheb of Porbandar and the Royal Family. Dr. Chavda the president of the branch accorded welcome to the guests. Twenty-four doctors were present. Two films on Cæsarian section and Aureomycin were shown to the members and the guests.

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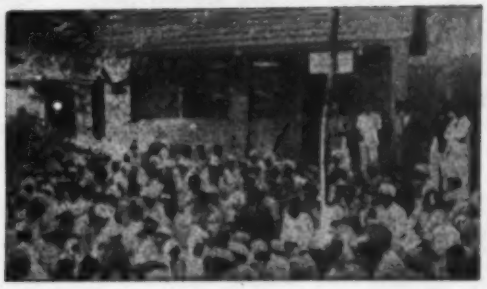
A meeting of the branch was held on 11-1-53 with Dr. H. H. Chavda in the chair. Twenty-three members were present. Dr. M. M. Nanawati spoke on "Treatment of Malaria". Then the members present eulogised Dr. Miss K. Nadkarni for her many sided activities. She was leaving that place on transfer.

POONA BRANCH—Dr. Abraham Stone, M.D., Vice-President, Planned Parenthood Federation of America gave a

DR. ABRAHAM STONE WITH THE MEMBERS OF THE [illegible] BRANCH



VILLAGE MEDICAL UPLIFT SCHEME INAUGURATED AT ULE

talk to the members of the branch on 1-12-52. The photograph shows Dr. Stone in the centre with some of the members of the branch.

SATARA BRANCH—The annual report of the branch shows that membership increased by 2. Eight monthly meetings were held during the year. The managing committee met 3 times and one annual dinner was held. The branch took a leading part in the celebration of the World Health Day.

SHIMOGA BRANCH—A meeting of the branch was held on 6-12-52 at Sagar. The President and Councillors of the municipality were At Home to the members. After the function was over, the clinical meeting was held and the following subjects were discussed, (1) Diphtheria by Dr. D. Krishna Murthy, (2) Skin Diseases by Dr. M. V. Shanbhag (3) Juvenile Diabetes by Dr. S. Sreepada Rao Bapat, (4) Pleurisy with Effusion by Dr. B. L. Shamanna, (5) Antirabies Treatment by Dr. Narasinha Murthy.

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A meeting of the branch was held on 17-1-53 with Dr. K. Rama Bhat in the chair. Dr. D. Krishna Murthy spoke on his "Impressions of the All-India Medical Conference at Patna."

SOUTH KANARA BRANCH—The report of the branch for the 7th year ending 30-9-52 shows that there was an increase in membership by 7. There were 18 meetings held during the year. Interesting clinical cases were discussed in some of the meetings. Special mention may be made of public meetings, the branch organised from time to time to effect closer contact with the public.

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The annual general meeting of the branch was held on 29-11-52 with Dr. A. F. Coelho in the chair. Forty members were present. After the annual report and the audited accounts for the year ending 30-9-52 were adopted, office-bearers for 1952-53 were elected with Dr. A. F. Coelho as president and Dr. M. Umesha Rao as secretary. The meeting closed after the display of sound motion picture on "Tolserol" and "Curare-Intocostrinmecostrin".

SHOLAPUR BRANCH—A scheme styled as Village Medical Uplift scheme was inaugurated at the village of Ule under the auspices of the branch on 17-11-52, by the President of the District Local Board. The Collector of Sholapur presided. Over one thousand villagers attended the function. Under the scheme the members would visit the selected village twice a week. A lady doctor is included in the team. Serious cases noticed are transported to the City Hospital, free of cost. Besides attending on the patients, the members would spread health education in the rural areas. (A photograph of the inaugural meeting is in next column, top).

TANJORE BRANCH—A meeting of the branch was held on 21-12-52 with Dr. N. R. Subramanian in the chair. Twenty-five members were present. Dr. R. Rajagopalan of Mayuram gave a talk on Trends in Tuberculosis. This was followed by a lively discussion.

TENALI BRANCH—A meeting of the branch was held on 20-11-52 with Major K. Vullakki in the chair. Office-bearers for 1952-53 were elected with Major K. Vullakki as president and Dr. B. Suryanarayana Sastry as secretary. Dr. C. Sitaramaiah, Professor of Physiology, Guntur Medical College, delivered a lecture on "Contributions of Physiology to Modern Medicine".

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A meeting of the branch was held on 18-12-52 under the presidentship of Dr. C. Krishnaiah. The members passed a condolence resolution on the sad death of Sri Patti Sreeramulu. A symposium on Alcohol as a beverage and medicine was opened by Capt. K. V. R. Chowdary and many members participated in it.

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A meeting of the branch was held on 23-1-53 under the presidentship of Capt. K. V. R. Chowdary. The president gave his experiences of the Patna Medical Conference. Also Capt. Imaduddin narrated his experiences of the Surgeon's Conference at Vellore.

TEZPUR BRANCH—A meeting of the branch was held on 15-11-52 with Dr. R. C. Das in the chair. Twelve members were present. Office-bearers for the year 1952-53 were elected with Dr. H. C. Das as president and Dr. S. C. Lahiri as secretary. The accounts submittted by the Secretary were approved.

TINSUKIA BRANCH—A special meeting of the branch was held on 4-1-53 with Dr. D. C. Chakraborty in the chair. Delegates to the next Provincial Conference were elected.

TIRUCHY BRANCH—The report of the year 1951-52 shows that 8 meetings of the Managing Committee and 12 Clinical meetings were held during the year and thirteen new members were enrolled.

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The annual meeting of the branch was held on 22-11-52. One hundred and twenty-five members were present. Dr. R. Kalamegham was in the chair. "Three Year Medical Course" was discussed and was disapproved by the members. Office-bearers were elected with Dr. T. S. Balasumramanyam as president and Dr. A. Dharmarajan as secretary. Dr. K. R. Doraiswamy gave a talk on "Tomography in relation to Pulmonary Tuberculosis". Lt.-Col. V. R. Thayumanavaswamy spoke on "Fracture Neck of Femur". Drs. R. Subramanyam and U. Mohan Rau lectured on Pulmonary Amœbiasis and Dysuria. Two films were also shown.

TIRUNELVELI BRANCH—A meeting of the branch was held on 25-10-52. Twenty-eight members were present. Office-bearers for 1952-53 were elected with Dr. K. Rama Ayyar as president and Dr. R. Gopalan as secretary. Dr. P. V. Venkatachalam gave a short talk on "Intravascular clotting."

INDIAN MEDICAL ASSOCIATION

(CENTRAL OFFICE, DELHI)

Statement of I. M. A. Building Fund Account

		Rs.	A.	P.	Rs.	A.	P.
Donations received and acknowledged in supplement of Journal of I.M.A. for the month of February, 1952					5310	14	0
Donations received since January, 1952 to date							
1.	Dr. J. T. Edwain (Trivandrum)	25	0	0			
2.	,, M. S. Wagle (Gadag)	500	0	0			
3.	,, T. N. Banerjee (Patna)	54	0	0			
4.	,, C. O. Karunakaran (Trivandrum) ...	100	0	0			
5.	,, B. V. Mulay (Sholapur)	298	0	0			
6.	,, D. I. Athavle (Jalgaon)	51	0	0			
7.	,, S. V. Sahesrabudle (Jalgaon)	51	0	0			
8.	,, (Capt.) B. Chakravorty (Arambagh) ...	50	0	0			
9.	,, R. N. Bagley (Saharanpur) ...	100	0	0			
10.	,, R. L. Sarma (Balasore)	5	0	0			
11.	,, Lakshmi Kant Shastri (Bezwada) ...	25	0	0			
12.	,, P. D. Mahalekar (Kalyan)	25	0	0			
13.	,, Members of Barsi Branch of I. M. A. ...	200	0	0			
14.	,, Members of Nizamabad Branch of I. M. A.	100	0	0			
15.	,, Members of Deolali Branch of I. M. A. ...	50	0	0			
16.	,, Members of Sundergarh Branch of I. M. A.	500	0	0			
17.	Members of South Kanara Br. of I. M. A.	72	0	0			
18.	Members of Sholapur Branch (2nd instalment) of I. M. A.	649	0	0			
19.	Anonymous donor through the Banaras State Bank, Banaras	40	0	0			
20.	Members of Jalgaon Branch of I. M. A.	102	0	0			
21.	Dr. Parmatha Nath Roy (Nawabganj) ...	5	0	0			
22.	,, V. R. Shrikhande (Kolhapur) ...	101	0	0			
23.	,, V. Seena (Bellary) ...	25	0	0			
24.	,, R. Singh (Jabalpur) ...	50	0	0			
25.	,, S. S. Rao (Cochin) ...	70	0	0			
26.	,, (Lieut.) Harbhajan Singh (New Delhi) ...	5	0	0			
27.	,, K. B. Bhawapurkar (Nagpur) ...	51	0	0			
28.	,, A. D. Mukharji (Calcutta)	180	10	0			
29.	,, R. Sinha (Calcutta) ...	100	0	0			
30.	,, H. Banerjee of Tripura	158	12	9			
31.	Delhi Provincial Branch ...	85	0	0			
32.	Dr. G. V. Joshi (Hubli) ...	50	0	0			
33.	,, Dr. S. M. Kallanpurkur (Hubli) ...	50	0	0			
34.	Capt. S. B. Palit (Berhampore)	50	0	0			
35.	Gujarat & Saurashtra Provincial Branch ...	928	0	0			
36.	Maharashtra & Karnatak Prov. Branch ...	1,000	0	0			
37.	Punjab State Branch ...	266	14	0			
38.	Dr. S. C. Sen (New Delhi)	52	0	0			
	TOTAL ...	6,225	12	9	6,225	12	9
	GRAND TOTAL ...				11,536	10	9

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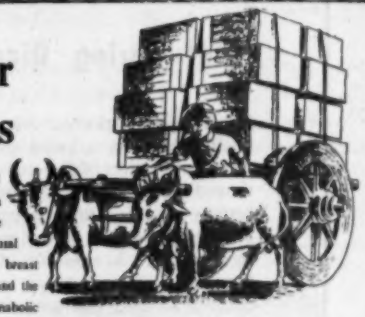

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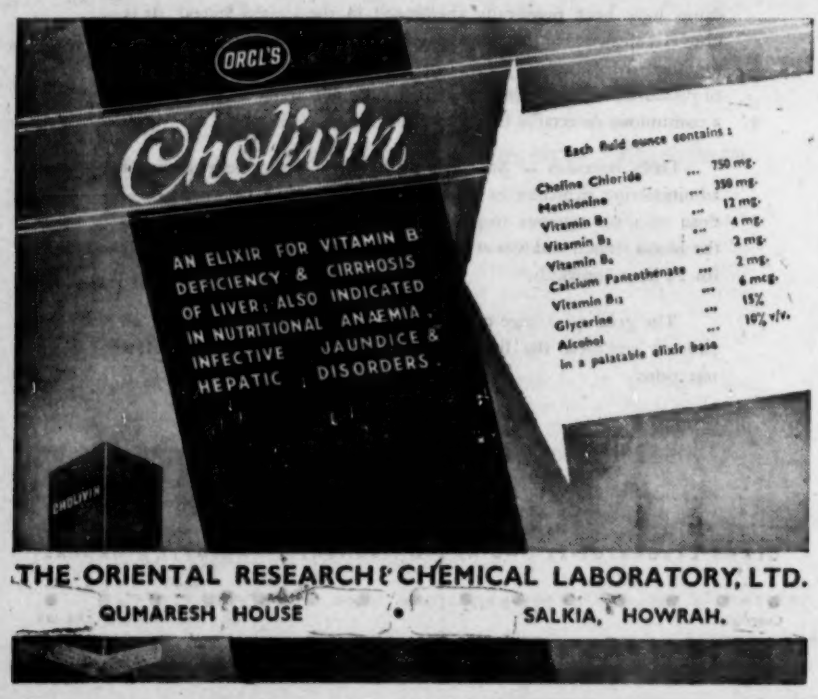
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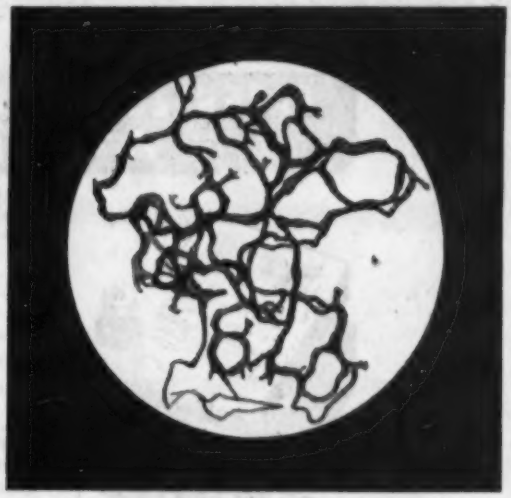

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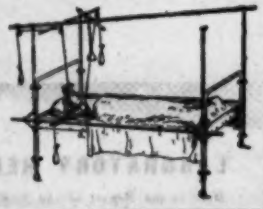

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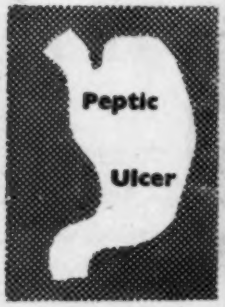

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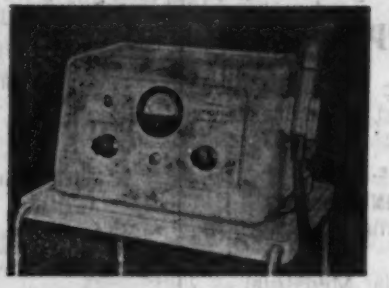

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